Pests

AND THEIR CONTROL

1942

MAY

VOL. 10 NO. 5

ORGAN OF THE PEST CONTROL INDUSTRY

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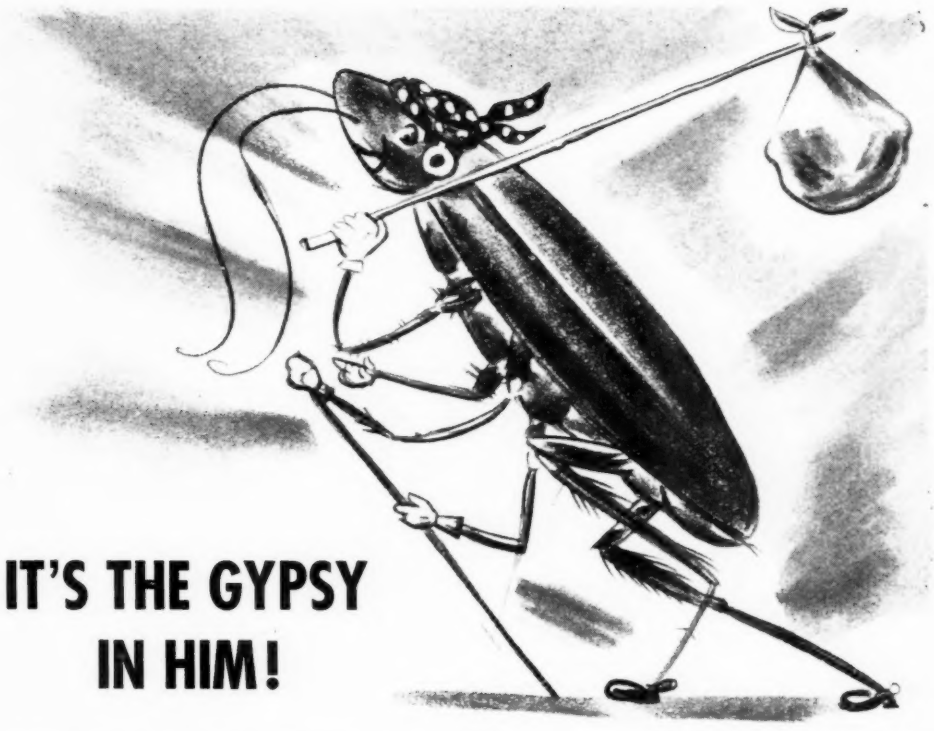

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EDITORIAL

Public Health Official Points Need for Pest Control

RIGORS of priorities have spawned an incidence of dislocations, some of which may prove blessings in disguise; others, quite the reverse. Of the latter, one such is the lack of metals, notably tin, relative to which Sol Pincus, Deputy Commissioner, New York City Health Dept., in a talk recently at the annual meeting of the United Retail Grocers and Food Dealers Association at the Waldorf-Astoria Hotel, New York, declared that: "As a result of shortage in metals, many more foods will be packed in cloth or paper, and more food will be handled in bulk rather than in individual containers. This practice will more readily permit access of insects and rodents and must be especially guarded against."

Apogee of all considerations, of course, is winning the war. Equally important with the maximum production of planes, ships and tanks, is the transcendent need maintaining—at least—a subsistence level of food, clothing and shelter at all times. One effective method to insure no less than this irreducible minimum is scientific pest control. Beyond question, the first of the two groups of contestants to drop below this zero point will crack. Moreover, it must be remembered that every pound of foodstuffs saved from pest spoilage will release on balance so many man-hours of labor for other crucial war needs.

Since neither the sit-down tactics of the woman, who, as reported recently in the press, fell on a mouse and killed it, nor the process of mowing 'em down with wooden blocks, will hardly rate a Peet-Grady passing mark, it is of utmost moment that PCOs, all of whom stand willing and anxious to do their bit, receive the "what with" to help insure adequate supplies of critical food stocks on hand, shelter overhead and shoes underfoot. Anything less than the "what with" will slow the war effort; enough will speed it.

Let Us Know, Please!

May we ask a favor We shall consider it a privilege and pleasure to publish in PESTS the names, addresses and service branches of members of the Industry inducted into the armed forces. You can help—a postcard with the highlights will suffice—we'll do the rest. Thanks!

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If People Were Clams

By WALTER S. McCLOUD

A WRITER for Collier's magazine ended an article on the evils of gossiping in these dark times with the wise admonition: "Let us emulate the clam." Good advise, that, which if heeded would not only divert comfort from the enemy but help to make the wheels of everyday business run more smoothly here at home.

Loose tongues not only sink ships—they waste precious hours and human energy, and dollars that could go toward building more ships. This has been so clearly demonstrated to me several times in the past few months that I have felt impelled to write about it as something for all of us to consider.

If we can spread the good gospel of "buttoning our lips" by any means at all, we will be helping ourselves as an industry. This is a selfish viewpoint, but it has a larger implication in actually bolstering of national defense.

One day last month, twenty-five dollars worth of effort went whirling dizzily around the lobbies of a large hotel chasing what turned out not to be a myriad of mice but just a silly rumor running wild.

If people were clams, or conducted themselves with some of their good sense, the day might have been saved for more constructive work. But you know how that sort of thing goes. Someone sees a mouse, runs with the tale. The story flies upstairs and down, until the place is "overrun with rodents" and a housekeeper frantically telephones for help. Men rush in, scout around, set bait; talk, look, listen, worry; and after several hours, end up with a catch of the ONE mouse (dead) that had set a couple of dozen human beings half crazy.

It has probably happened to you. Why don't we do something about it?

I intend to do something about it, have acted already in fact. Slipping my kid gloves on first, of course, I told that housekeeper a few things about the evils of rumor and how she could help the cause by asking her staff not to go daffy if they "thought" they saw a mouse or a cockroach or a bug, but instead to whisper the news into her pearly ear so she could be sure before calling out the militia.

If we told all we knew about the bad conditions we find here and there, we'd soon end up in the ash-can. Rumor has an awful lot (and I mean awful) to do with the health of our business. Let's wipe it out where we can by demanding some ethics from the other side of the fence, not just for ourselves but for the great big cause of our country's defense.

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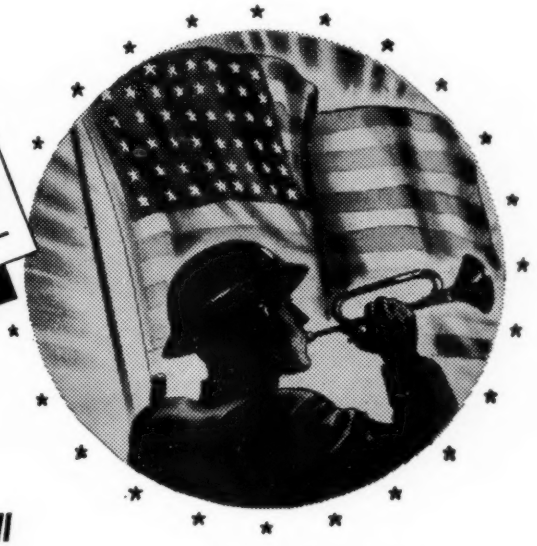

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Using Baits in Rat Control

By ERNEST M. MILLS, *U. S. Fish and Wildlife Service, New Brunswick, N. J.*

THE most efficient means of destroying rats for temporary control is by means of poisons. It is most important that attractive baits be used, otherwise few or no deaths will occur. The subject of baits will be discussed here without relation to the poison used, although there is some connection between the two. The kind of poison utilized is less important than the kind, preparation, and exposure of bait. In many cases, it is almost as difficult to get rats to consume unpoisoned baits as poisoned ones. Thus, special attention must be given to baiting to insure adequate results by the poisoning method.

The kind, number, or variety of baits to be used is the first consideration. There seems to be no one food or "best bait" that all rats will eat under all conditions. If one could find such a "best bait," he should be designated as a second "Pied Piper," The obvious explanation of this fact is that the rat is an omnivorous animal, showing no predominant choice for any one type or group of foods. Some authorities do state however that the rat is primarily a grain eater. As rats vary in bait acceptance under different conditions, the best solution is to employ the "self-feeding" plan in exposing baits, that is, make available a number of different foods so that the animals can select the one preferred.

Should one use single basic ingredient foods or combinations of foods? Many of the older authorities have given formulas with several elements or what might be called "one-shot" formulas. For example, one formula combines bread-crumbs, kippered herring, fat, and squill. Probably the English have issued more different rat bait formulas than any other researchers. Close examination of these formulas will reveal the general plan of preparation. First, there is the basic material, generally a cereal, such as rolled oats, flour, or meal. Second, an attractant food is added, such as cheese, fish, castor sugar, suet, lard, or drippings. Third, a binder or moistener is added, if not already included, such as glycerine, syrup, or water. Fourth, an artificial lure is included, such as aniseed oil, caraway, musk, or rhodium. Fifth, a coloring matter may be included, such as lampblack or Prussian blue. Sixth, a preservative is sometimes suggested, as salicylic acid. Most of the resulting English formulas are in dry or paste form with a few mixtures being liquid or moist.

The recommendations of the Fish and Wildlife Service have taken a different course from the English technique. This Service suggests that a number of simple baits from various food classes be exposed separately except when stable baits are necessary. The following seven food classes and some good baits from each class are:

Meat—Ground lean hamburger, beef melts, liver, sausage, bacon, chicken.

Fish—Ground fresh fish, canned fish as salmon, sardines, tuna, cat food.

Cereal—Rolled oats, corn meal (mainly cereal), bread, chicken mash.

Vegetable—Fresh tomato, green corn, carrots.

Fruit—Cantaloupe, watermelon, banana, apple.

Other—Peanut butter, chocolate, dried milk, raw eggs.

Liquid—Water, milk, syrup.

From a practical point of view, the use of three kinds of foods, one each from any of the seven classes, will usually indicate an attractive bait although the more kinds of bait exposed the closer to 100 per cent acceptance will be obtained.

To return to the matter of the best bait, some data on this subject will prove interesting. E. G. Boulenger, Curator of the London Zoological Gardens conducted tests with baits. He states that plain bread was the most attractive bait. Assuming 100 to represent bread, he found oatmeal to stand at 80, tallow at 70, banana at 60, bloater paste at 30, maize, cabbage, dripping, smoked fish and cheese at 20, with lard, meat and fresh fish at 10.

The Fish and Wildlife Service has figures on acceptance between three kinds of bait, used mostly on farms. The reported information was from voluntary observations by users of the bait and is not the result from scientifically controlled experiments. It should be kept in mind that the baits were exposed by many average persons under a wide variety of conditions. Of 14,681 persons reporting, meat was the best taken on 3,105 places, fish on 2,594 places, wet grain on 2,093 places, and no choice on 3,215 places. Thus, the figures suggest that meat was the most attractive of meat, fish, and grain.

Recently 43 Pest Control Operators were asked to give their one most successful or attractive rat bait if only one such bait could be used under all conditions. The results from this questionnaire showed that 16 stated bread or grain, 12 meat, 11 fish, 3 fruit, and 1 cheese. These figures would represent observations from their many service men over a period of years.

Are fresh baits better accepted than canned baits? The evidence as compiled by the Fish and Wildlife Service shows that fresh baits are better. From the same volunteer farm observers as mentioned above, 4,565 farmers reported that no fresh meat, fish, or grain was eaten on 52 farms. When substituting canned baits of the same food materials, 7,959 farmers reported that rats failed to eat any of the three kinds of bait on 844 places. The ratio of fresh bait to canned bait on these figures would be 1.2% to 10.6% respectively. These statistics refer to the number of times or places that baits were eaten with no figures available on the quantities consumed.

To summarize the discussion on baits, it appears that there are no basic foods or attractants in accordance with any hard-and-fast rules but only in a general way. Some basic foods do not always prove attractive and some attractive foods seem to be basic. There is probably less confusion in ascertaining just what foods rats will eat by exposing a number of simple foods rather than using a complex mixture. Thus, it follows that it is next to impossible to devise any "sure-fire" formula to lure all rats.

The next problem as outlined in the English formulas is the question of binders and moisteners. As the materials used for these purposes are usually in liquid form, the two terms can be considered together. A binder for bait materials will be necessary to

make dry ingredients into individual pieces, a paste form, or into a moist condition. In other cases, the addition of dry poisons will make wet baits too dry so that more liquid of some nature needs to be added. Furthermore, some rats will not take dry baits and dry poison, such as barium carbonate with any dry material. The first point to consider in a general way is whether or not rats prefer wet baits or dry baits. There has been a great difference of opinion on this matter as has been seen when discussing the various baits or foods mentioned above. Some foods are dry, some moist, some very wet, some liquid so that only a general trend might be observed on the basis of available data. Few authorities on rat baits divide rat baits into these two categories and then state the general preference of rats. Opinions from 47 Pest Control Operators were divided into 34 stating that wet baits gave better results with 13 stating dry baits.

The simplest binder and moistener is water. It can be added to most baits in a reasonable amount without upsetting the poison percentage. The main objection to water is that such baits tend to dry out or harden quickly. For this reason, the tendency is to add more viscous liquids as glycerine and various oils. Vegetable oils, such as cottonseed, peanut, and cocoanut, become rancid in a relatively short time so that they should not be used for permanent baits. Glycerine and mineral oil will keep for a longer period of time, but are probably not as attractive to rats as vegetable oils. There are other possible oils, such as cod liver oil, bacon oil, butter, and lard. Further work needs to be done to determine the efficiency of these various oils and binders and their relation to the assimilation of poisons by rats.

Baits might be divided into two types, fresh and permanent. Fresh baits might be defined as those baits that are freshly prepared and designed for overnight exposure without any radical change in the character of the baits. Permanent baits might be defined as those baits that do not radically change their characteristics during several hours or days of exposure and can be stored for a long period of time without spoilage. In general, fresh types will give better results than permanent baits but there is a real need for the more stable types of baits. In some cases it is not possible to make fresh baits either at the place of exposure or for transport so that baits which can be made in quantity at one time and place and will remain in acceptable condition after long storage are very desirable. Several formulas for such permanent or stable baits can be found in Conservation Bulletin No. 8, U. S. Fish and Wildlife Service, entitled "Rat Control."

Do artificial lures make baits more attractive? A number of volatile oils have been mentioned in the literature, such as oil of anise, caraway, cinnamon, peppermint, and rhodium. The best recent study showed that the various lures tested possessed no merit as attractants to white rats. (Soap and Sanitary Chemicals, Feb. 1941, "Rat Lures.") There have been a great many observations made as to the efficacy of lures under natural conditions for the brown rat but no large-scale controlled experiments have been made so far as known. Thus, it is recommended that all so-called lures be omitted from bait formulas unless satisfactory information to the contrary has been obtained.

The effect of bait color on acceptance has not been adequately worked out. It may be true that certain colors are attractive to rats although rats feed mostly at night when it is probably difficult for them to distinguish between colors. Certain insects show a color preference. The Wildlife Research Laboratory of the Fish and Wildlife service ran a short series of feeding tests on white rats using different concentrations of carmine red and eosin dyes with breadcrumbs as the bait. The results showed that there was no apparent choice between colored baits and uncolored baits.

Some conditions make the addition of preservatives to baits desirable. When the fresh baits are exposed under hot and humid conditions despite moisteners, such baits may deteriorate before the rats find them. In other cases, quantity mixes or mixes far from the scene of exposure causes a considerable lapse of time before the bait is finally distributed. Of course, the preservative must not interfere with palatability. The Wildlife Research Laboratory ran a series of tests with preservatives on hamburg as the bait, the test animals being white rats. The preservatives used were sodium sulphite, sodium fluoride, betanaphthol, phenol, paradichlorobenzine, sodium nitrite, and salicylic acid. The results showed that sodium fluoride and paradichlorobenzine interfered quite definitely with the rate of acceptance of the baits. The preservative action of all these chemicals was effective for 24 hours. The conclusion reached was that sodium sulphite was as effective as any of the preservatives and caused the least interference with bait acceptance. The technical grade of sodium sulphite can be used at the rate of one-half on one per cent to bait, by weight.

To increase the chances of bait acceptance or in difficult cases where several previous baitings have been employed, prebaiting is recommended. This procedure consists in exposing untreated baits precisely like poisoned baits except that no poison is used. The reasons why prebaiting is helpful are that the locations, quantity, and preference of baits consumed will be determined. It is best to prebait for several nights until the rats are eating the baits in good quantity without fear or suspicion. Then skip a night or two before adding the poison to the successful baits. It is essential to place the final baits in the exact locations where previous baits were taken. During the entire baiting procedure, all uneaten baits should be collected each day.

What steps should be taken to assist the baiting operation? It is important that all other sources of rat food be removed or covered as far as practicable. For example, particular attention should be given to open garbage cans, unprotected crates of fruits and vegetables, open bags of grain, and sources of water so that the rats will be forced to eat the set baits. While baiting, do not remove the nesting places of rats, alter their trails, or make a general clean-up as such disturbances may arouse the suspicions of the rats to be poisoned.

Baits should be used in teaspoonful quantities as most poison formulas are figured on the basis that a single bait will kill at least one rat. If the factor of drying out should be considered, wet baits can be used in larger sizes. The character of the infestation has a direct bearing on the size of baits. If there are few trails with many rats, these trails should be heavily baited, but if a few rats are travelling over a large area, many small baits distributed over this area will give better results. In general, the distribution of many small baits is preferable to a few large baits.

The question of wrapping baits is often asked. Should the baits be placed directly on the floor or in containers? Unfortunately, these questions can not be answered on the basis of adequate data as no one has studied these subjects under natural conditions on a large number of places to make the figures statistically significant. However, some work has been done and some observations made. The Wildlife Research Laboratory of the Fish and Wildlife Service ran an experiment with white rats in cages with food placed on the floor of the cages and

(Continued on Page 28)

The Ideal Undergraduate Curriculum for Terminal Training in Professional Entomology

By CLAY LYLE, *State College, Mississippi*

EDITOR'S NOTE: *The following address was given by Dr. Clay Lyle before the Fifth Pacific Coast Pest Control Operators at San Francisco, Calif., December 29, 1941.*

WHEN this subject was assigned no definite fields of professional entomology were designated for consideration, probably because the vocational outlook is rather limited for a student who plans in advance for only four years of entomological training. Most students who choose entomology on entering college are thinking of the profession in a broad sense, perhaps because of contacts with federal or state research, extension or regulatory entomologists. Although many who are now filling these positions capably have only the Bachelor's degree, teachers should certainly encourage students interested in such positions to prepare for graduate study. Furthermore, since commercial firms usually look for advanced degrees when they fill research positions, the prospective entomologist with only undergraduate training is largely limited to selling his services as a pest control operator or in sales promotion of insecticides. Professor J. J. Davis refers to these two groups as service entomologists and industrial entomologists, respectively. So far as I have been able to learn, no institution in this country offers a curriculum designed especially for these groups, probably because the demand is too small. The few who decide to be pest control operators or engage in insecticide sales promotion before entering college are probably older than the average and perhaps have already been employed as assistants by established operators.

In what respects should the course of study for terminal training differ from the usual curriculum for students preparing for graduate study? Certainly the more practical or applied courses should be emphasized for our student has only four years in which to acquire a great body of knowledge in many different fields. In addressing a pest control operators' conference at Berkeley, California, in February, 1941, Professor Essig[1] said:

> "The activity of the pest control operators are varied. You must have a considerable knowledge in many fields; you must be architects, to understand structures; carpenters to remove and restore timbers; toxicologists, to know your products and their effects on buildings and their contents; zoologists and entomologists, to control rodent, insect, and other animal pests; plant pathologists, to be familiar with and to treat wood rots and other fungi; inspectors to ascertain the needs for treatment; salesmen, to sell yourselves and your skill; diplomats, to deal skillfully with the public and the law; collectors, to obtain the hard-earned cash to conduct your business; and many other similar professional types."

A few years ago a well-known teacher in addressing the American Association of Economic Entomologists listed desirable courses for an entomological student which would total about 200 semester hours, including graduate work, but exclusive of any courses in agricultural subjects. The insecticide sales promoter, especially, should have a general knowledge of agricultural problems and practices while the pest control operator may occasionally find such information helpful. Since few colleges require more than 144 semester hours for graduation the suggestions which follow are based on this number. Therefore, we shall have to pass up some desirable subjects and any entomological courses which do not contribute directly to the practical knowledge of the student must be weighed very carefully against the cultural value of other courses needed for a broad, general education, for our graduate must be equipped to take his place as a well-rounded, valuable citizen of his community.

Realizing that any curriculum will have its faults, the following is offered as approximately what would be suggested to a mature individual registering at Mississippi State College with the avowed intention of becoming a pest control operator or engaging in some other field of professional entomology with only four years available for preparation:

Agriculture—12 to 18 hours, depending on previous experience of student, but probably including Agronomy, Animal Husbandry, Horticulture, Surveying and Drainage.

Botany—12 hours, including Botany, Plant Physiology, and Plant Pathology.

Business—9 hours, including Bookkeeping, Advertising and Salesmanship, and Business Law.

Chemistry—24 hours, including a year of General Chemistry, a year of Organic, and courses in Technical Analysis and Industrial Chemistry.

English—18 hours, including Composition, Literature, Speech, and Business Correspondence.

Mathematics—6 hours, including Algebra and Business Calculations.

Social Sciences—18 hours, including Psychology, Sociology, History, Economics and Government.

Zoology and Entomology—33 hours, including General Zoology, Physiology and Hygiene, Taxonomy and Biology of Vertebrates, General Entomology, Economic Entomology, Taxonomy, Parasitology, Insect Ecology, Toxicology and Physiology, and Special Problems in Applied Entomology.

Other Sciences—6 to 12 hours, including Bacteriology and Physics.

During the summer vacations the student would secure employment, if possible, with an established commercial exterminator or engage in some other field of pest control in order to acquire actual experience. However, in states such as Mississippi with no

[1]Essig, E. O., The common names of insects. Pests, July, 1941.

large cities and few commercial exterminators a special problem course in applied entomology would be included in the senior year to provide the student with the practical experience so necessary in this profession. In this course he would be expected to visit groceries, markets, feed stores, bottling plants, dairies and milk processing plants, as well as many residences, making inspections and soliciting business. He would be required to prepare a written report on each contract secured, outlining the problem, stating the corrective measures to be employed and the price agreed upon, for the approval of the Department before the work began. Prior to soliciting this work he would have been required to take the state examination for a pest control operators' license. It is much better for the prospective pest control operator to become accustomed to rebuffs and closed doors while still a student than to face this as a new experience after graduation. One of our students tramped the streets for two weeks and inspected dozens of houses before he secured his first termite job, although he later treated more than 100 houses before leaving college. For this course in applied entomology required reading and references would include the following:

Journal of Economic Entomology

Entoma

Soap and Sanitary Chemicals

Pests

Shepard's "Chemistry and Toxicology of Insecticides"

Cotton's "Insect Pests of Stored Grain and Grain Products"

Other publications dealing especially with termite control, fumigation, and the control of household and stored products pests.

In previous courses he would have become familiar with most of these and also with:

Comstock's "Introduction to Entomology"

Peairs' "Insect Pests of the Farm, Garden and Orchard"

Metcalf and Flint's "Destructive and Useful Insects"

Herm's "Medical Entomology"

Folsom and Wardle's "Entomology With Reference to its Ecological Aspects"

Wigglesworth's "Insect Physiology" and others.

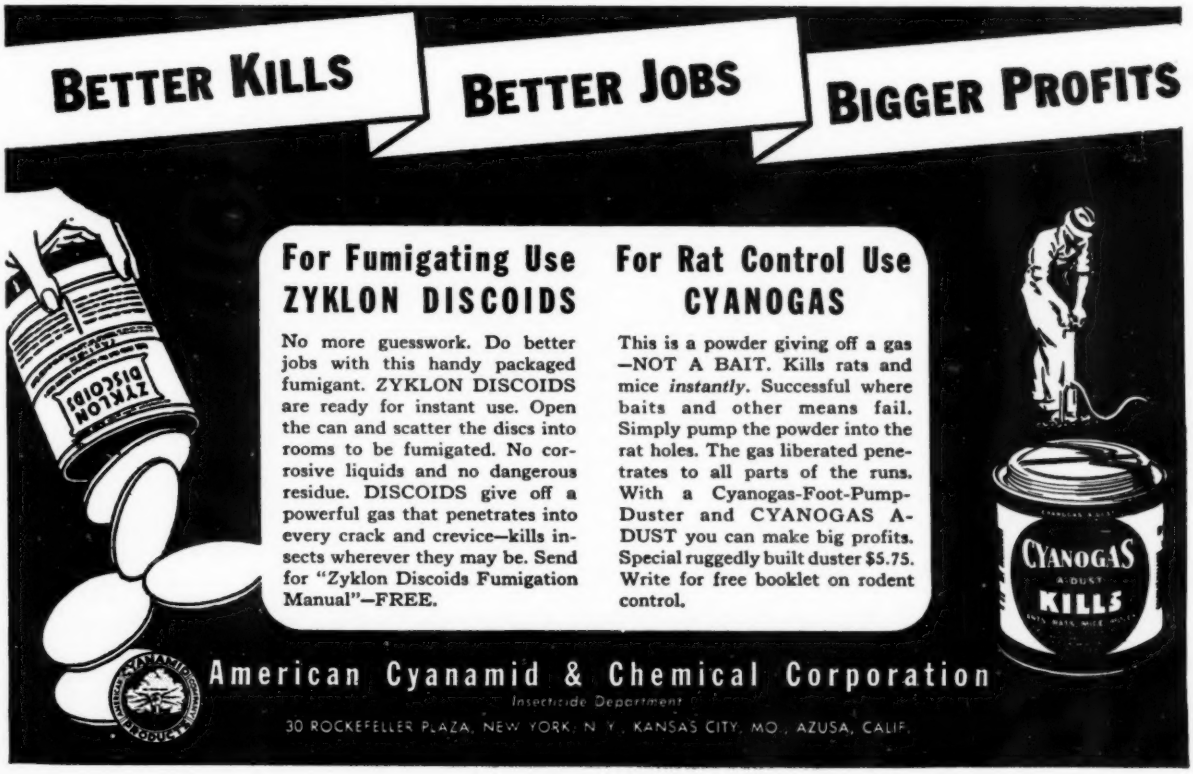
He would also be encouraged to attend regional meetings of entomologists and pest control operators during his college career. Advertising material and price lists of insecticides and other chemicals would be available to the student at all times in order to become familiar with the sources of materials and their approximate prices. He would be encouraged to order supplies from the leading firms in our area with a view to having a good credit rating established by the time of his graduation.

Chinese Denounce "Germ War"

The Chinese Foreign Ministry formally notified all legations and embassies at Chungking recently that Japan frequently has resorted to bacterial warfare against China, "ruthlessly in violation of the principles of international law and the principles of humanity."

A note said that plagues had broken out in various parts of China, caused by Japanese-distributed bacteria.

Common Rat Flea in Hawaii Can Spread Typhus Fever:—Added to the recent troubles of Hawaii is the discovery by one of its scientists, Joseph E. Alicata, that a common rat flea of the islands is capable of spreading the germs of endemic typhus fever.—*Science News Letter.*


BETTER KILLS
BETTER JOBS
BIGGER PROFITS
For Fumigating Use
ZYKLON DISCOIDS
No more guesswork. Do better jobs with this handy packaged fumigant. ZYKLON DISCOIDS are ready for instant use. Open the can and scatter the discs into rooms to be fumigated. No corrosive liquids and no dangerous residue. DISCOIDS give off a powerful gas that penetrates into every crack and crevice—kills insects wherever they may be. Send for "Zyklon Discoids Fumigation Manual"—FREE.
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CYANOGAS
This is a powder giving off a gas —NOT A BAIT. Kills rats and mice *instantly*. Successful where baits and other means fail. Simply pump the powder into the rat holes. The gas liberated penetrates to all parts of the runs. With a Cyanogas-Foot-Pump-Duster and CYANOGAS A-DUST you can make big profits. Special ruggedly built duster $5.75. Write for free booklet on rodent control.
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CYANOGAS
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Insecticide Department
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Pests and the Public Health

By G. LYNDE GATELY, M.D., *Health Commissioner, Health Department, Boston, Mass.*

EDITOR'S NOTE: *This paper was presented by Dr. Gately at the New England Pest Control Association meeting held in Boston, Mass., March 24, 1942.*

I AM very glad to have the opportunity to address a group of professional pest exterminators and to link their work with the task in which I am involved, namely, the protection and promotion of the public health. The health protection of a community like Boston, old and congested and as varied as it is, presents a very complex problem, the solution of which is dependent on the intelligent and faithful assistance of numerous groups and numerous specialists. Adequate public health protection requires the services of physicians, but it is also essential to have the contributions from the public health engineer, the laboratorian, the public health nurse, the vital statistician, the sanitary inspector, the food inspector, the rat collector, the health educator, the epidemiologist, the pest exterminator, and others.

The goal of public health must be not only the prevention of premature mortality and preventable disease, but likewise, the development of robust men, women and children who appreciate keenly the joy of living and in whose veins the zest of joyous living courses and not merely the ability to remain alive in a desultory sense. The goal of public health is also to extend the comforts, decencies and conveniences of life in order to make life easier, sweeter, and more enjoyable. If we envision the goal of public health in this broad way, we shall find that the elimination or control of pests has a fundamental role in any community program.

It is interesting to turn to the dictionary for a definition of the word, pest. Such an inquiry is very rewarding to the uninformed. Pest is defined as "a fatal disease like the plague." It comes from the Latin word "pestis" meaning plague and the French word "peste" with the same meaning. The term pest has also been used in connection with a swarm of destructive insects. We have often heard of a pest of locusts or a pest of grasshoppers. In more recent years, the term pest has also come to mean a nuisance or an annoyance.

Anybody who is familiar with the problems that confront the health officer of any community will realize that "pests" of one form or another —human, animal, vegetable, insect— plague his existence day after day. We will ignore in this discussion the human pests who plague the health commissioner for jobs or for personal or economic favors. The numerous complaints that flow across his desk day after day have to do with rats, lice, mosquitoes, flies, cockroaches, bedbugs, vermin of all kinds, stinks and other odors, and various other pestiferous conditions that plague the lives of people, that endanger their health and that interfere with the enjoyment of life.

There are numerous pests in the world. Some endanger life; others destroy man's food supply and undermine his habitations and other structures. Still others are just nuisances which do not kill or maim but which detract appreciably from the enjoyment of life. I have spoken of pests of locusts and grasshoppers. I may also include the boll weevil, the corn borer, worms of all kinds, the Japanese beetle, the gypsy moth, caterpillars, animal ticks, lice, fruit flies and flies of all kinds, chinch bugs, etc., as illustrations of a great variety of pests that vie with man in the struggle for survival. It is not my purpose to discuss here the great and important aspects of economic entomology. The work of the various state and national departments of agriculture and the various agricultural experiment stations testifies to the great economic significance of combatting insects, worms and all other types of agricultural pests.

At this time I want to speak more fully of the pests that affect human health, human comfort and human decency, for it is in these spheres of activity that you are specifically and vitally interested. Public health has made great strides in the past sixty years. The general death rate has been cut by more than 50 per cent and the average life span of man at birth has been increased from 40 years to approximately 63 years, or by more than 50 per cent. Certain diseases which were responsible for much widespread misery and death have been brought under control and in some instances verge on the vanishing point. Among these diseases are those associated with insects and filth —in other words, the so-called pest diseases. These diseases are spread through a defective environment and hence have been more readily amenable to control measures than have such diseases as gonorrhea and syphilis, influenza and the common cold, which depend for control, at least in part, in the control of the individual.

What are the diseases associated with pests with which you are to some extent concerned? First and foremost perhaps, especially in this part of the country, is the disease most prominently associated with pests, namely, bubonic plague. This disease which is transmitted from rodents to man through the infected flea was responsible for the Great Black Death in Europe during the Middle Ages. It has killed literally millions of people through the ages and even today is responsible for widespread disease and mortality in Asia, in Africa, and in South America. Unfortunately, it has gotten a firm hold in the United States in California and in the Gulf states particularly and it will require years of effort to eradicate it. Although we do not have any cases of bubonic plague here in Boston, we must be constantly on guard against it, for rats are great travelers and ships come to such a great port as Boston from all parts of the world.

Furthermore, as you know, rats are very destructive of food and property and during the past three months the Boston Health Department has inaugurated a campaign of education and sanitary inspection in the North End in order to more effectively combat the rodent problem. If this campaign is successful, as we have every expectation it will be, we expect to extend the program to every district in the city. We shall encourage people to use professional exterminators and we shall instruct them in the hazards which the rat represents and how best to control him. But in addition to bubonic plague, the rat is associated with murine typhus fever in the United States, with rat-bite fever, with infectious jaundice, with trichinosis, and with food infections.

Another great group of pest diseases are those transmitted through infected mosquitoes. In addition, there

is the great annoyance and discomfort associated with mosquito bites even from the harmless varieties of insects. In the United States the mosquito-borne diseases are malaria and dengue fever. Recent work has shown that equine encephalomyelitis is, likewise, mosquito-borne and there are some who have associated infantile paralysis with mosquitoes and with rat fleas. Flies of various kinds have also been incriminated in the past year or two with the dissemination of infantile paralysis. I have not mentioned yellow fever in relation to mosquitoes because the disease is not prevalent in the United States at present; but the mosquitoes that transmit this infection exist in our southern states abundantly and a conflagration of first rate proportions can be started here at any time if our vigilance should be relaxed. Every plane that arrives in the United States from South and Central America, and formerly also from the Orient, is thoroughly disinfected under the direction of the U. S. Public Health Service and a careful check on all communicable diseases among immigrants to the United States is maintained by the same agency. Filariasis, another mosquito-borne disease, is prevalent in the tropics.

As professional exterminators you are generally not interested in combatting mosquitoes and mosquito-borne diseases, especially in this part of the country, but as fumigation is sometimes necessary to combat the danger of lurking infection in a ship or in a dwelling, you might be called upon to render professional service in that way.

Happily, we are not troubled with European typhus fever, a louse-borne disease, but the significance of the louse in transmitting one of the world's greatest plagues has been heralded in books, in scientific articles and in the daily press. The late Dr. Hans Zinsser has dramatized the importance of lice and of typhus fever for man in his famous book, " Rats, Lice and History," and in his autobiography, "As I Remember Him." In this disease personal cleanliness and possibly immunization by vaccination are the most effective ways of waging war against it, but the use of special fumigants and reagents to kill the eggs is likewise important.

Flies represent another serious pest. Some of them suck blood and may therefore transmit certain infections that way; but all of them may transfer infections mechanically. Among them may be mentioned erysipelas, the pyogenic infections, anthrax, tetanus, as well as the intestinal and filth-borne diseases. There is no doubt that sanitation has played an important role in combatting fly-borne diseases and the substitution of the automobile for the horse as a means of transportation has helped mightily in achieving this goal. However, the importance of larvicides and other tricks in the armament of the professional exterminator are well known aids in fly control, even today.

Ticks represent another important group of pests in relation to the public health in the United States today. As a matter of fact, it was Texas Fever—a tick disease of cattle—that was the first animal disease that science proved could be insect-borne. This was done by Dr. Theobald Smith in 1893 at the time when he was with the U. S. Bureau of Animal Industry. However, the tick-borne diseases that affect man are Rocky Mountain Spotted Fever, Tularemia and African Relapsing Fever. The progress made against Rocky Mountain Spotted Fever has been one of the most brilliant chapters in the history of the U. S. Public Health Service. Combatting this disease, however, as well as tularemia is beyond the normal scope

SOLVAY

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SOLVAY SALES CORPORATION

Alkalies and Chemical Products Manufactured By The Solvay Process Company

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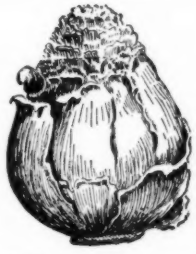

HOPKINS'

REDRATSQUIL

(TRADE-MARK REG.)

POWDER or LIQUID

Made from the genuine Red Squill bulbs—the world's most potent non-poisonous Raticide. Oven dried under a temperature of 176° F. —biologically tested to assure maximum killing power. Relatively harmless to human beings, domestic animals and pets. Write for information and prices on HOPKINS' REDRATSQUIL — in Liquid or Powder form.

HOPKINS' CROW BRAND

PYRETHRUM POWDER

and CONCENTRATED EXTRACTS

CONCENTRATED EXTRACTS give you the same extraordinary killing power in liquid form. Full-strength, 100% quality Pyrethrum Flowers are used by Hopkins to produce high-kill insecticides. Our Pyrethrum Powders are milled to any degree of fineness you may require. HOPKINS'

J. L. HOPKINS & CO.

IMPORTERS • MILLERS • MANUFACTURERS

220 Broadway • New York

of activities of the professional exterminator.

We come now to those pests which are still, unfortunately, too common in our midst even today and in which you do play a fundamental role in all control work. I refer to the control of cockroaches, bedbugs, ants and other vermin. Here, all your ingenuity has free play. You fight these insects by depriving them of their food supply, by the use of poisoned baits, by traps, by fumigation, and by any other method that may be available. While comparatively few cases of disease are known to be caused by these insects, the fact that they may come in contact with infectious material and may convey it mechanically and the fact that some of them suck blood, makes them potentially dangerous to the public health. In addition, they are, of course, an intolerable nuisance and symbolic of filth, lack of cleanliness and conditions of life not associated any longer with accepted standards of living.

I have indicated in a brief way some of the insect and rodent pests of significance to man from the standpoint of adequate public health protection and decency and the role which the professional exterminator plays or may play in their control. The battle against these pests is an ever continuing one and in a real sense they represent the greatest challenge to man for his ultimate survival. These pests breed freely and rapidly. They require comparatively little food for survival. Our homes and our food supply provide them with shelter and essential food. They are able to live on our domestic and commercial wastes. They are clever and secretive. They have learned how to avoid man during his wakeful and active hours. It is a war which goes on all the time. Any armistice on our part or any retrogression into slothful living gives these pests the opportunity to gain ascendency once more. I therefore welcome you into this campaign to protect and to promote the public health, to make life cleaner, more decent and more comfortable. And for the success of your campaign I wish you God-speed. I would only urge you to adopt high professional standards; to insist that only properly trained and properly qualified personnel should serve as professional exterminators; and if you are successful in placing your work on a high and efficient professional basis, I am sure your work will grow in popular esteem and in public value.

"The public forgets the business when the business forgets the public."

—*N. W. Ayer & Son, Inc.*

Patriotic Canadian PCO Finances Own One-Man Propaganda Campaign to Stimulate War Effort

His Blasts Draw Praise From Some; Ire From Others

CONVINCED that too many of his countrymen are still thinking and acting in terms of business-and-social-life-as-usual and fearful of the worst: that the war may be lost as a result and all that it portends, M. A. Sanderson, Mgr., Reliable Exterminators and veteran-of-the-line in the First World War, has set out determined to do something about it before it is too late. And so, over his own signature and at his own expense, he has published a series of crisply-worded, corn-stepping editorialized-advertisements in Toronto newspapers dramatizing the urgency for an all-out war effort on the part of all.

Commenting on the human interest angles of Mr. Sanderson's one-man campaign, Marketing—Canada's only journal for advertising men and sales managers—has this to say:

Since the middle of last December, Toronto newspapers and one Ottawa daily have carried at irregular intervals advertisements signed by M. A. Sanderson, manager of Reliable Exterminators (Regd.), Toronto. The series has attracted notice by reason of unconventionality of subject and copy.

Six advertisements have appeared and not one of them has been concerned about vermin extermination other than the Nazi, Fascist and Nipponese variety. Mr. Sanderson is a member of the Council of the Canadian Corps Association and shares to the full the anxiety felt by that organization at what it considers to be lack of "total war effort" on the part of the Canadian Government.

"When the blow fell at Pearl Harbor, I felt I had to get into print or blow up," Mr. Sanderson told "Marketing." "Many things I had been thinking crystallized and I sat down and wrote the first advertisement of what was to become a series. I addressed my remarks to Prime Minister King, imploring him to give the country a lead, and asking if leading the country did not appeal more to him than just leading a party. Naturally—and as I expected—I was accused of playing politics, although I have never had any political affiliations of any kind. I was told that such advertising would hurt my business but I replied that if Hitler wins I shan't have any business!"

The announcement of the plebiscite inspired Mr. Sanderson's second advertisement in which he asked Mr. King a few pointed questions about his birthday celebration of a few weeks previously. Number three, on February 20th, was equally pungent on the subject of Victory Bonds and this insertion pulled many favourable replies, especially from salesmen selling the Bonds. Similar appeal featured the fourth in the series commenting on the loss of the "Spikenard" reported two days previously. Official particulars of the Canadians taken prisoner at Hong Kong produced a blast of the trumpet on the day following the announcement.

The advertisement that really put the series well in the public eye was that of March 5th, rapping "600 Toronto skiers" for spending approximately $12,000 on an excursion to the Laurentian Hills. "Did this party include, among its 600, any who had previously told a Victory Loan canvasser they couldn't afford to buy not even a $50.00 Victory Bond?" Mr. Sanderson's phone has been busy ever since this ad appeared. People demand to know if he is in uniform—if not, why not? Has he bought any Bonds, and, if so, has he bought till it hurts? To all of which challenges, Mr. Sanderson assured "Marketing," he is able to give an entirely satisfactory reply.

Not Helping Sales Any

Asked the delicate question: "Will this advertising help your sales?" Mr. Sanderson frankly replied that he did not think it would. "I'll bet that if the Toronto Ski Club premises are over-run with cockroaches this Summer, I don't get the job of cleaning them up!" he said. "This series of advertisements has cost me over $700 to date and is my contribution to the effort to bring about a total war effort in this country. It was not necessary to increase my advertising in order to swell business volume. Last November was as good as August—my peak month—and last December business done was treble that of December 1940."

We salute Mr. Sanderson for his patriotism, his courage, his realism, and for his imaginative treatment of the subject matter. Readers interested in obtaining a set of the ads—and they are well worth studying—can do so, we are sure, by writing Mr. Sanderson whose address is 64 Wellington Street, W., Toronto, Canada.

Spare Tire Averts Bee Mutiny

POCATELLO, Idaho—It took courage, but the rationing board told Kenneth Bradshaw he could not have a tire. "I've got a truckload of bees — and a blowout," he fumed. "If I don't get a tire by morning, those bees will make trouble." A long-distance telephone call to a brother in a near-by city produced a spare that kept the peace in Pocatello.—N. Y. Post.

Items of Interest

Land Slugs and Snails

The favorite haunts of slugs and snails are damp or moist places under or near accumulations of decayed vegetation or rubbish, piles of old boards, bricks, and stones, and dense, low-growing vegetation; they are also found in basements and drain pipes and on rough stone walls and well walls.

This indicates the importance of keeping the basement and spaces beneath porches dry and the garden and greenhouse clean and free from rubbish, old boards, bricks, and like materials, which offer protection to the pests. Pointing-up foundation walls and the walls of dug wells is also an aid in control.

When slugs or snails have become established, it is recommended that a poisoned bait consisting of 1 ounce of metaldehyde to 3 pounds of wheat bran, slightly moistened, be scattered over the infested area or, in the case of mushroom houses, placed in many small piles along the edges of the beds. Sometimes fairly good control can be obtained by the use of a bait consisting of 1 part of calcium arsenate in 16 parts of bran, moistened, and scattered about a garden or other places where it may be used with safety. Both metaldehyde and calcium arsenate should be used in the bait when the humidity is continuously high.

When only a few slugs or snails are present, they may be collected by hand picking at night, with the aid of a lantern or flashlight, and destroyed; or they may be killed in the daytime in their hiding places beneath boards or rubbish.

Foreword, Farmers' Bulletin No. 1895, U. S. Dept. of Agriculture.

Ersatz Rats

Via William Russell's "Berlin Embassy," 307 pages, Dutton, $2.50, comes this story: Before Hitler invaded the Low Countries, a German and a Dutchman were standing on the border talking over the bad food situation in the Reich.

"I hear it's so bad in Germany," the Dutchman said, "that you're even eating rats."

"Ach, and were those rats good!" the German exclaimed reminiscently. Then his face fell, "But now," he added sorrowfully, "they're all gone, and the government is feeding us **ersatz** rats."

New Fly Swatter

The Victory fly swatter has joined the ranks. Made by the U. S. Mfg. Corporation of Decatur, Ill., it is constructed of a paper fibre swatting blade and a wooden handle. Unless the WPB relents on a recent order prohibiting the use of iron or steel in swatters after July 1, U. S. expects to have the field pretty much to itself this year.

People, Not Bugs, Are Bugs

Zoologist Alfred E. Emerson of the U. of Chicago spends a lot of time peering at insect life, but he has found time also to study representatives of Homo sap. Results of his research are somewhat discouraging—to Homo sap., that is. For Scientifico Emerson thinks the termites, the bees and the roaches have a lot on human beings.

For one thing, stated he recently, humans are "less integrated" than insects, even though they are "socially more versatile" and "less stereotyped."

For another, they keep fighting, although "social wars within the same species of an insect society are practically non-existent."

If bugs manage to dwell in amity together, inquired he, why can't people?

Why not, indeed?

The base you choose for your insecticide has a lot to do with its Sales Appeal. For example, Penn-Drake INSECTI-SOL, being permanently odorless, 100% volatile, and absolutely PURE enables you to make your product most effective and appealing to the trade. Samples examined after 22 months were still water white and odorless. INSECTI-SOL contains nothing to stain or soil clothing, drapes, rugs, etc.; it enables insecticides to float longer and penetrate further; it is 100% volatile—yet does not evaporate before maximum toxic effect is reached.

And the perfect base for mothcides — *is Penn-Drake Deodorized Naphtha*

penn drake petroleum products

For full information write, Dept. 106.

PENNSYLVANIA REFINING CO.
GENERAL OFFICES · BUTLER, PA.
Refineries at Karns City and Titusville, Pa.
Makers of
White Oil, Technical Oil, Petrolatum, Petroleum Sulphonates, etc.

Tube-Building Habits of the Eastern Subterranean Termite

By RICHARD T. HOLWAY, *Muirhead & Holway, Inc., Duxbury, Mass.*

EDITOR'S NOTES *Reprinted from Journal of Economic Entomology, June, 1941. Cuts furnished by West Virginia University.*

AN UNDERSTANDING of the tube-building capabilities of the subterranean termite is of fundamental importance in the application of control methods. This subject has not been thoroughly investigated and the many claims as to what termites will or will not do have caused much confusion in the mind of the general public.

This situation seems largely due to the failure of many control operators to recognize the factor of frequency or probability in any particular termite activity. Another source of misunderstanding for the layman is the tendency to attribute the capabilities of a particular genus to termites in general. For example, there are one or two authentic cases in which winged reproductives of the subterranean termites have succeeded in establishing a small colony in a church steeple. Small accumulations of leaves and soil retained enough moisture to make colonization by the royal pair a possibility. There are records of other cases of unusual activity such as the construction of tubes to the height of several feet and of buttressed free standing tubes.

These things are interesting and have considerable popular appeal but their importance from a control standpoint is often exaggerated. Economical control should be designed to deal with the habitual and occasional types of attack, while added expense to protect against rare and isolated forms of termite activity is seldom justified. Very few figures on the frequency of the various types of attack are available and the control designer must depend on his own experience and judgment.

It is obvious that wood in direct ground contact is most subject to termite attack. Of next importance is the common conditions in which wood is open to concealed attack from the ground through masonry joints and cracks or other inadequate barriers.

A third source of trouble may be the use of shelter tubes or runways to travel from soil to wood. It is with this subject that the following observations deal.

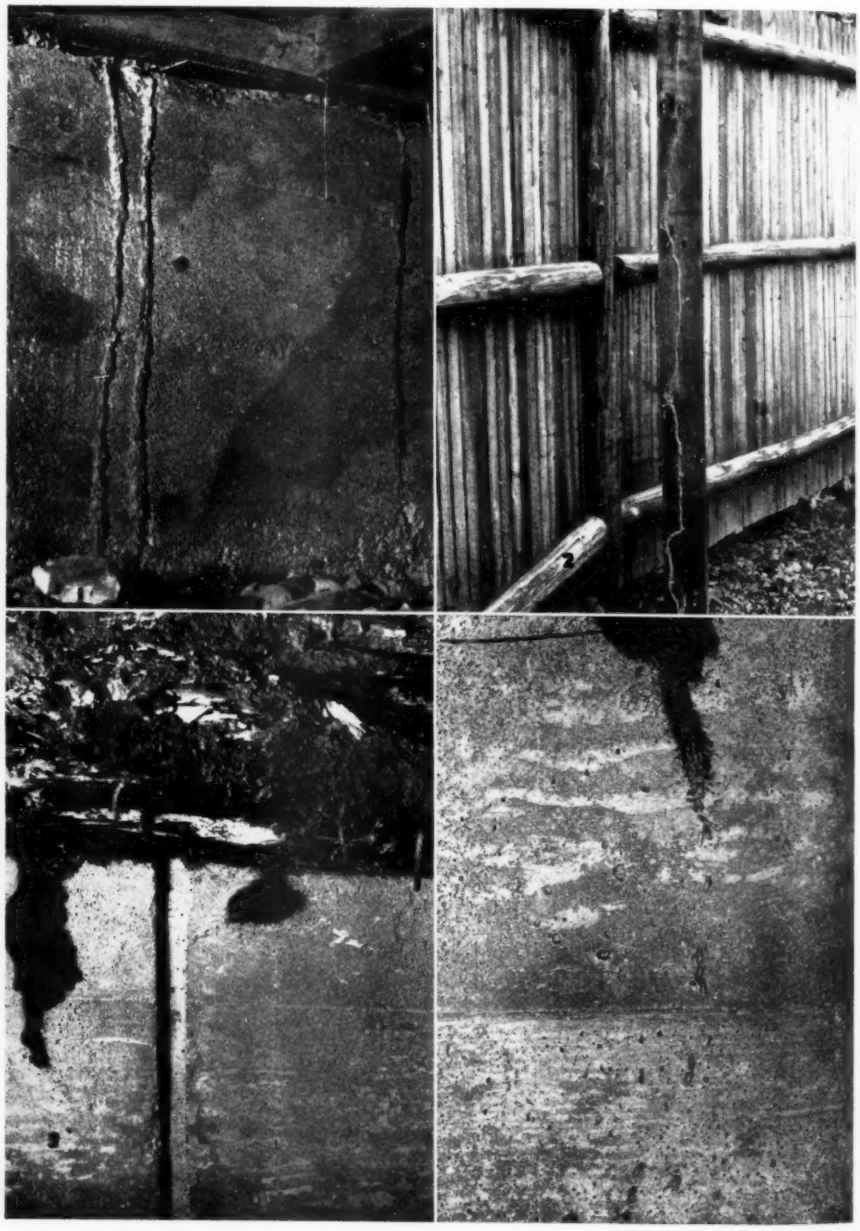

FIG. 1—1. Tubes built down over foundation wall in partial excavation. Sills were originally attacked at a filled porch. 2. Tube built up 7 feet over creosoted post set in center of active colony. 3. Start of tube-building activity after infected log is placed on pit wall. 4. Termites leaving tunnel entrance to travel to soil.

The most important factor in the study of tube-building is the direction in which the tube is constructed. It is generally assumed that runways found on foundation walls have been built upward by termites on their way to the wood above. Actually these tubes, in the great majority of cases in the North, are dropped down after the termites have become established in the wood which they have attacked from some easy point of access.

Field Experience—Analysis of the history of attack in many termite infested buildings leads to this conclusion. Figure 1 is an illustration of a typical situation found in a partial excavation or basementless area. On the outside, several feet to the left of the tubes, is an entrance step behind which termites found direct access to the sill. After working along the sill the colony dropped these tubes down to provide a new and more direct soil contact.

Out of several hundred building inspections we have found one doubtful case in which it is possible that original entrance to the building was gained by constructing a runway up over the foundation in a basementless area. Turner (1939) has observed only two cases, in about a thousand, in which the original entry was so made. With few exceptions tubes found on foundation walls have been traced to colonies which had become established in the building at some point, usually hidden, where wood was in ground contact or where wood could be reached through hollows, voids or mortar joints.

Laboratory Colonies — In order to study more effectively the tube-building habits of these subterranean termites large colonies of **Reticulitermes flavipes** are kept in concrete pits where favorable conditions may be maintained throughout the year. These indoor pits are $4\frac{1}{2}$x$6\frac{1}{2}$ feet and are constructed with reinforced concrete walls and floors. The surface of the three feet of soil placed in the pits is 24 inches below the top of the walls.

Observations of termite activity in these pits over a $2\frac{1}{2}$ year period are in accord with field experience gained from inspections of infested buildings. During this time no tubes have been constructed upward to a height of more than 12 inches even when the wood supply was completely removed. Only four tubes were attempted and of these one attained a height of 12 inches, one of 10 inches, and two of 6 inches. All of these were constructed in corners. As a matter of fact, whether building up or down, termites seem to go out of their way to find a right angle in which to build. This is probably due to the fact that two sides are ready made and they have only the roof to construct.

It should not be assumed from these observations that Reticulitermes cannot and does not, under certain conditions, construct tubes upward. Anyone who has kept large numbers of termites in small containers without food knows that such activity usually occurs. It is not uncommon for tubes to be carried to a height of 24 inches or more under such conditions. Also, where wood in ground contact stops off against a foundation and a colony has become established in this wood, tubes are often constructed upward in search of another food supply.

This would indicate that concentration of population may be an important factor in judging what conditions favor upward tube-building by Reticulitermes. Colonies confined in $\frac{1}{2}$ a cubic foot of soil quickly produce high tubes, whereas many times more termites in the 60 cubic feet of the pits build only 4 short tubes. Possibly in the pits dispersal through the soil in search of food reduced the concen-

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tration of termites necessary for extensive tube-building. In small containers the confining walls and bottom would tend to force an upward migration.

This investigation was concerned with general reactions only and controlled experiments have not been attempted. It is hoped that future quantitative tests with measured numbers of termites, volume of soil, and amount of available food and moisture, will produce some correlation between pressure of population and occurrence of upward tube-building.

A factor of considerable importance in the frequency of tube-building is exposure to drying effect of the air or mechanical weathering of storms. For this reason, with few exceptions, tubes are found in dark, poorly ventilated areas. Light (1934) states that Reticulitermes rarely, if ever, builds covered ways over a foundation in the open. This would indicate that the habits of western species of Reticulitermes, in this respect, are similar to those of flavipes. It should be remembered that other genera such as Heterotermes, Nasutitermes and Coptotermes are supposed to exhibit a much greater tendency for upward tube-building than does Reticulitermes.

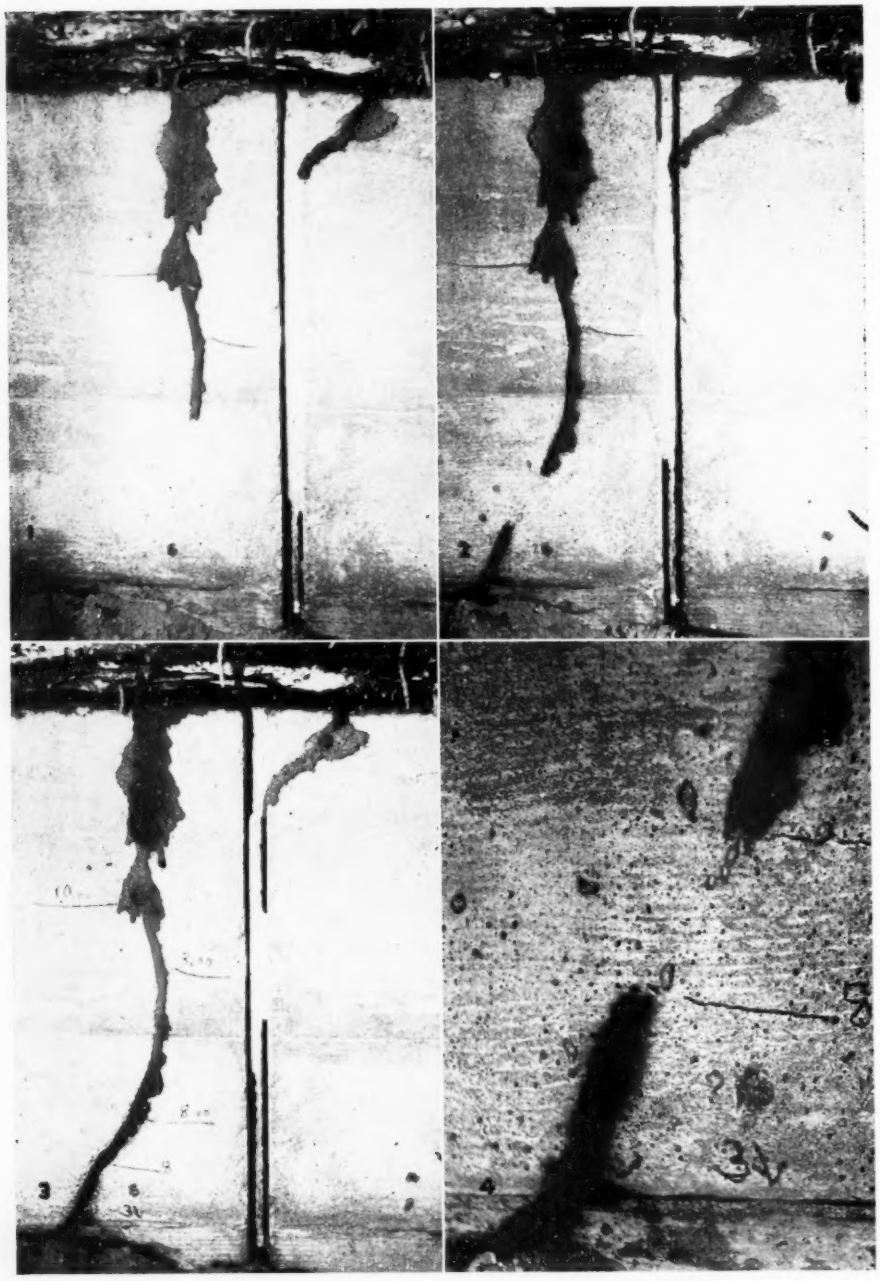

FIG. 2—1. Termites which reached the soil start building along soil line. 2. Tube at soil line turns up to meet descending branch. 3. Completed tube. Note two additional tubes which are also constructed from both ends in corners of slot. 4. Coseup before tubes are joined. Lower portion of soil particles, upper portion of partially digested wood.

Unusual Types of Tube-Building.—The following cases of unusual tube building by Reticulitermes flavipes in the field and laboratory are cited to emphasize the difference between normal and unusual types of activity. This distinction is, of course, artificial and varies with conditions but is significant where the conditions can be economically controlled at any given building.

An unusual occurrence of natural tube-building has been observed at Concord, N. H. Figure 1-(2), shows a creosoted post upon which tubes were built upward to a height of 7 feet. In this instance the new wood was placed in the center of a large colony which had destroyed an existing post. At checks and knots the termites entered to attack wood beneath the limit of penetration of the preservative. Eventually the tube reached the untreated cross timber above, which was attacked. Soon after this picture was taken a severe storm washed away the tube and it was not rebuilt.

The causes of such unusual activity are difficult to determine with any certainty, but it would seem that the size of the colony and the exploration of the treated wood surface for points of access may have led to the extended tube-building.

Construction of tubes downward from infested wood to soil is common and easy to bring about experimentally. When heavily infested wood is placed on the pit wall the termites usually start to drop tubes within 24 hours. In the majority of cases the insects do not leave the open end of the runway for more than a few inches but build their shelter as they progress.

When the wood contains a large colony and moisture is needed quickly, however, the termites travel from wood to soil for relatively long periods without stopping to construct shelters. In one case a continuous column travelled back and forth from wood to soil for 10 hours before any attempt was made to erect a shelter tube.

Figures 1(3, 4) and 2(1, 2, 3, 4) show another case of unconventional termite activity. An infested apple log was placed on the pit wall. At the end of 24 hours many tubes were started at various points on the log.

A few were constructed faster, apparently because of more concentrated activity at these points (Fig. 1 (3)). Then a large number of termites left this tube and proceeded to the soil (Fig. 1(4)), where they commenced to build upward to meet the descending tube (Fig. 2(1, 2)). In about 24 hours more the two ends were brought together and joined (Fig. 2(3)). A closeup at this point (Fig. 2 (4)), shows that the upper portion was constructed of partially digested wood or frass, while the lower portion, darker and granular in appearance, was composed of particles of soil.

In the meantime 5 other tubes were being constructed in the same manner (Fig. 3). Note that four of these were built in the corners of slots used to divide the pit. A seventh tube, started later than the others, was never completed and the termites did not leave the entrance to the shelter.

On our opinion these unusual activities occurred because the population was so large that the available moisture would have been dissipated before the runways to the soil could have been constructed in the usual way. When construction is carried on from both ends at once the time required to complete a tube is cut 50 per cent as there is room for twice as many termites to remain at work on the building operations.

There is some evidence that the termite colony sends out scouts or surveyors to determine the direction of the soil as there was definite selectivity in direction of tube-building. All the many tubes built down from wood

FIG. 3—View of other tubes constructed in same manner. The one at the right was never completed to the soil.

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FIG. 4—General view of termite pit showing horizontal tube at soil line.

placed on the pit wall were on the inside walls; none were attempted on the outside where the concrete floor of the laboratory would have been encountered (Fig. 4). Reversal of the log or variation of the light source did not affect this unfailing attraction to the inner walls and soil.

Summary—Analysis of termite attacks on buildings and results of laboratory experiments are in agreement with the reports of others that subterranean termites of the genus Reticulitermes rarely, if ever, construct tubes upward over foundation walls in the open. The cases which we have seen where such activity has occurred have resulted from excessively large colonies developed where there was wood in the ground adjacent to the foundation walls.

In dark, confined places such as basementless areas, Reticulitermes may build tubes over foundation walls in order to reach wood above. The probability of frequency of this activity depends upon such factors as relation of termite population to size of area, wood adjacent to the wall, and ventilation.

The majority of tubes seen on foundation walls in the East are constructed down and not up.

Under special conditions termites may reveal unusual types of activity such as travelling for many hours without tubes, constructing tubes from both ends, or building up many feet in the open.

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Turner, N., and J. F. Townsend, 1939. Control of Termites in Buidings, Connecticut Agr. Expt. Sta. Circ. 134:4.

The Evidence Piles Up!

The warning note struck in the news item reprinted here is one of a series similar in import made by public health officials and others throughout the nation in the recent past.

Health officials ask all-out war on rats

SAN FRANCISCO, March 25 — Health authorities called today for an all-out war on rats.

If California cities were bombed, thousands of disease-spreading rats would be released from sewers, basements and warehouses.

Dr. Bertram P. Brown, state director of public health, said the result might be an outbreak of bubonic plague—an outbreak such as struck San Francisco after the 1906 earthquake when rats, dislodged from their natural quarters, overran the city and spread the disease.

More evidence—if any is needed at this late date—which should help insure a favorable verdict in the court of public opinion of the necessity to make ample supplies and equipment available for the P.C.I., so that it too can do its utmost in the war against rats—biped as well as quadruped.

Woodpeckers seldom injure trees, but destroy injurious tree insects.

—*Science News Letter.*

Fighting Plague with Sanitation

By BERTRAM P. BROWN, M.D.,
Director of California State Department of Public Health

(Dr. Brown is guest conductor today of Miss Stafford's column. America's leading health officers will write similar exclusive messages about the health of America.)

Public health prevention, science and sanitation permit the people of the Western states to live safely with plague.

Since the first human epidemic in the United States was recorded in 1900, plague has been found in rats and wild rodents in 10 Western states, yet only rare, scattered human cases now occur. Plague is primarily a disease of rodents. The common mode of transmission is via the bite of a blood-sucking insect, usually the flea.

Effective public health measures include traveling laboratories, rodent suppression, rodent proofing of buildings and public education concerning the danger of handling wild rodents.

Trucks equipped as field laboratories are the reconnaissance forces in the battle against plague. Operated by the U. S. Public Health Service, California and several other states, their purpose is to find rodent infestation.

Rodents are killed, combed for fleas and dissected by the field crews. Animals which appear suspicious, and fleas, are sent to a central laboratory. If plague is found, rodents are eradicated in the locality, a preventive measure which must be repeated each year, since new arrivals may become infected by fleas which remain in the burrows. Besides rats, plague has been found in squirrels, chipmunks, gophers, prairie dogs, field mice and rabbits.

Center of research is in the San Francisco Bay region in the laboratories of the U. S. Public Health Service, University of California's Hooper Foundation and the California Department of Public Health. An immune serum prepared from horses is available for treating the rare human cases. Laboratory experiments with mice indicate that sulfathiazole may be useful.

Although man has learned to live in comparative safety with a once dreaded disease, preventive measures must continue unabated. For so long as plague smolders in the rodent population, there is the potential danger that insects will carry the disease to man.

Storage Closets

P.M., New York, reports fiberboard closets in themselves are not adequate protection against moths. Two leading authorities agree that the cedar or pine oil treatment in these closets is of no practical use. However, if they close tightly so dust cannot seep through cracks, these closets give the same protection as garment bags.

Importance of Clean-up after Fumigation

In order to contribute towards greater safety in fumigation service operations, we reprint here some common sense suggestions appearing in March-'42 issue of Discoid News Bulletin.—Editor.

The Fire Department of a neighboring city recently informed us that they had found some cans of Zyklon Discoids in an empty building!

Investigation disclosed that the cans contained **spent** discs. The Pest Control Operators who had fumigated the building had apparently gathered up all of the spent discs after ventilation, putting the discs back into the cans, possibly with the intention of disposing of them later. However, the Fire Department discovered them before they were disposed of.

In another instance, State Police communicated with us regarding some cans of Zyklon Discoids which they had found in the hands of some children who were playing with them! Investigation here also disclosed that the cans contained **spent** discs and it appears in this case that a few of the cans had apparently fallen off a truck along the highway, enroute to the dump.

One can readily realize what an alarming and dramatic story might have been built up in each case by some imaginative newspaper reporter. The result of such publicity would most certainly be bad for the PCO involved and would also be harmful to the industry in general.

In order to avoid occurrences of this kind we, therefore, very strongly urge the PCO to make it a definite part of his fumigation procedure to immediately gather up all spent discs and cans after ventilation and to burn or bury the spent discs if possible. If it is not possible to do this at the place where the fumigation is carried out, then, the discs should be taken to the nearest place where they can be disposed of in this manner.

As to disposal of the cans, in view of the present-day necessity for conserving tin, steel and similar metals, it becomes a patriotic duty of the PCO to see that the cans are turned over to the proper collection agency.

Before doing this, however, the labels should be removed and if it is not convenient to remove them, then, the cans should be crushed by stepping on them or in some other manner so that they are not again usable. If, however, it is desired to use the cans for any purpose, the labels should be removed.

Motto: Do not place "spent discs" in same cans. Take all equipment away from premises that have been fumigated.

New Talc Deposits

Large new talc deposits have been found, according to "Inside News" in U. S. and Canada and are being operated to replace talc previously imported from Italy, India, manchuria, etc. A deposit in Newfoundland will soon be mined and processed.

NO SHORTAGE OF STIMTOX "A"

Pest Control Operators and compounders of roach powders facing a shortage of sodium fluoride, should investigate Stimtox "A." This FORTIFIED pyrethrum powder is most economical and effective for the control of crawling insects. The cost per pound of formulae employing mixtures of pyrethrum powder and sodium fluoride may be substantially reduced through the use of Stimtox "A," as the saving in pyrethrum cost alone is over 30%. To extend present stocks we suggest that you replace two-thirds of the sodium fluoride in your formula with Stimtox "A." Write for detailed information.

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The Acme No. 4 Gas Masks have been tested by fumigators in many parts of the world with satisfactory results. These Masks have proven that they DO Provide Protection to the wearer against the deadly fumigating gases.

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The Acme No. 4 Gas Mask is made of pure live rubber which combines strength, comfort and lightweight. The Mask fits snugly to any normal face without undue pressure which heretofore has caused headaches and discomfort.

Always specify type of gas or chemical being used, when ordering Acme Canisters.

Write for Folder PM 387 describing these Acme Masks and Canisters—its FREE.

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Insecticide Act Enforcement

The New Regulations for Enforcement of The Insecticide Act of 1910 Are Interpreted

By C. C. McDONNELL, *U. S. Department of Agriculture*

EDITOR'S NOTE: *Delivered before Natl. Assn. Insecticide & Disinfectant Mfrs., New York, December 2, 1941.*

THE Insecticide Act of 1910 provides that the Secretaries of Agriculture, Treasury, Commerce and Labor (the latter now Department of Commerce), "shall make uniform rules and regulations for carrying out the provisions of this act." In conformity with this provision of the law, regulations for its enforcement were adopted December 9, 1910. Several changes have been made in the regulations as first published, but the new regulations issued October 1, 1941, represent the first time they have been revised in their entirety. (See Soap and Sanitary Chemicals, October, 1941, P. 111-113 for complete text of the new regulations. Ed. Note.) With years of experience in the enforcement of any regulatory law and the accumulation of court decisions and interpretations of the law, it is natural to expect that the point of view of enforcement will change to some extent. However, insofar as this law is concerned there has been no fundamental change in its enforcement that would cause a deviation from the purpose for which it was enacted.

We cannot, of course, take anything away from the law nor add anything to it. The regulations are designed primarily to acquaint the industry with the methods to be followed in its enforcement and point out the Department's interpretation of the law's provisions, which is based on the wording of the law itself and the statements made by members of the Congress indicating what it was designed to accomplish when the bill was before it.

In writing the regulations we have attempted to cover the subject fully, but concisely, and to word them so that they will be clear and readily understood. It is impossible, however, to foresee all problems that may arise and I am glad to have the opportunity to explain more fully some of the points brought up in the following questions.

With reference to the "DEFINITIONS" four questions have been submitted.

Reg. 161.2 (d)

Q. "The definition of 'package' includes not only the individual container but apparently the shipping carton as well. Does this mean that the information required to be shown on the labels of individual cans must also be shown on the carton or shipping containers holding a dozen or more cans and, if so, does this mean that the entire label would have to be shown on the shipping cartons, or only the specification information required by your recent Rules, Regulations and Orders?"

Q. "Is it necessary to place the declaration of ingredients on the package carton of a disinfectant if each individual bottle within the carton is correctly labeled and the dealer or consumer removes each bottle from the carton for resale or use?"

Answer—Reg. 161.12 (b) provides that the ingredient statement, where required, shall be placed on the label of each individual package or container, and also on the carton or outer container if there is one, which is displayed under customary conditions of purchase. This includes not only packages of products that go to the consumer direct or through dealers, but also packages, as defined under Reg. 161.2 (d), that are shipped to other manufacturers or processors. In other words, in the case of products enclosed in a carton or package, either singly or more than one to a carton or package, which may be displayed or sold either singly or in the original carton or package, all matter required by the law to be placed on the label should appear on the carton or outer container of whatever form, as well as on each individual container within the carton or package. It is not necessary that the case or carton in which the product is shipped, that serves merely as a shipping container and from which the product is removed before it is offered for sale, shall bear any label or statement of ingredients.

Reg. 161.2 (f)

Q. "We understand that advertising matter, such as booklets, literature, etc., that would be shipped interstate to a customer, would be considered part of the label although it is not actually shipped with the merchandise nor distributed in the store in the immediate proximity of the product."

A. As desirable as such a provision would be, the law does not authorize us to go that far. In the administration of the law such booklets and literature are not considered as a part of the label unless they actually accompany the shipment of the article in interstate commerce, or are referred to on the label of the article, or in other literature accompanying the shipment.

Reg. 161.2 (g) (h)

Q. Does the Insecticide Division exercise jurisdiction over products sold for the control of: (1) Root-knot Nematodes; (2) Snails; (3) Slugs; (4) Sow Bugs; (5) Human Lice; (6) Roundworms or Tapeworms of Poultry and Livestock; (7) Botflies of Horses; (8) Screwworms of Sheep; (9) Wood-destroying Fungi; (10) Athlete's Foot Organisms; (11) Sheep-Fouling Organisms; (12) Rat Poisons; (13) Animal Repellents?

A. (1), (2), (6), (12), (13): No, if sold exclusively for these purposes.

(3): The law applies to products sold for the control of the larvae of certain insects sometimes referred to as slugs—for example, the pear slug, the rose slug, and others—but does not include products for use against the shell-less snails which are frequently seen about gardens and damp places.

(11): Not to the usual type of such organisms known as barnacles.

The next question relates to "HEARINGS."

Reg. 161.7.

Q. We would like to know just how the Commissioner would arrive at an opinion as to whether to grant a firm

a hearing. It says that a hearing will be granted only when it is believed a useful purpose would be served. We feel that this is not too specific. It further states that no hearing will be granted prior to seizure action pursuant to Section 10 of the Act. Will they actually seize the merchandise, or stop the sale of the merchandise before a hearing has been held?"

A. (By the reference to the Commissioner" the questioner apparently is of the impression that this law is still being administered by the Food and Drug Administration.)

This question involves two different procedures, criminal action and seizure action. Seizure action, as authorized by Section 10 of the law, is designed to protect the consumer from the purchase of insecticides or fungicides that are grossly misbranded or adulterated; products that may cause injury to the plants on which they are to be used; or products that are ineffective for the purpose for which they are recommended, whether this be due to faulty manufacture or deterioration after manufacture, or whatever the cause might be. Action here must be prompt and the only way it can be accomplished is through proceeding against the goods by seizure, thus preventing their further distribution. This is an action against the goods by libel and is not a criminal action against the shipper. There is no provision in the law calling for a hearing before such action. In fact its purpose would be defeated by such procedure, due to the delay involved in granting a hearing.

With reference to criminal action the law provides that if examination shows a product to be misbranded or adulterated, the Secretary of Agriculture "shall cause notice thereof to be given to the party from whom the sample was obtained." The United States Supreme Court has ruled, in a case arising under the Food and Drugs Act of 1906 (which contains the same wording with reference to hearings), that this does not mean that a hearing shall be given to all persons charged with a violation of the Act—(United States v. Morgan, U. S. 222, 274). However, Reg. 161.7 provides that a notice in writing shall be sent to the party making the shipment, or other interested person, and that an oral hearing may be given on specific request for such a hearing.

Some manufacturers, especially small one-man concerns that have had no previous contacts with the Government in connection with this Act, get panicky when they receive a citation from the Government and immediately think they have to call on their congressman or rush to Washington. Frequently in such cases the violation is of such a character that there is no disposition on the part of the Government to take the case to court if a willingness to correct the faults is shown, and further correspondence may show that to come to Washington would be an unnecessary waste of time and money. In some cases the manufacturer may not clearly understand the charges and after they are explained to him more fully by letter he realizes that he can make reply by letter equally as well as by a personal interview. Then there are cases in which the violation is of such a character that a reference to the court is clearly indicated regardless of what the reply might be. In such instances we write him frankly to this effect and let him know that it would be wasting his time and money to appear for a personal hearing. We don't wish to imply that a request for an oral hearing is never granted. Cases are frequent where manufacturers are given oral hearings, and we do not discourage such a hearing where it appears that it might be worthwhile.

Reg. 161.12 (a) (b)

Q. "This requires that all words,

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THE WORLD'S LARGEST BOTANICAL DRUG HOUSE

J-O PASTE

To the vermin exterminator who is desirous of extending an outstanding service to his client J-O PHOSPHORUS PASTE *is* the solution

For the control of rats and roaches this product is widely and successfully used by Pest Control Operators throughout the country.

J-O ROACH TRAP

For use with J-O Paste

Convenient & Safe

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Send $1.00 and we will ship to you prepaid a two-pound can of J-O Paste, with twenty-four J-O Roach traps, as illustrated.

Prices on 25 and 50 Lb. Pails on request

FREE — WRITE FOR COMPLETE AND VERY VALUABLE ANTIDOTE CHART.

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Manufacturers of Exterminating Products Since 1874

statements and other information required by the Act to appear on the label shall be in the English language. In one instance we use the English language, then we give the identical statements in Italian because many of the users of this product can not read English and are Italians. A circular has a certain portion appearing in English, then in Spanish, then in what appears to be Polish, in Yiddish, in German and in Portuguese. Since booklets are going to be considered a part of the label, we think that this point might be questioned wherever this foreign printing appears because of the wide use of this circular."

A. The law requires very little on the label—merely a statement of the total amount of arsenic present and the amount in water soluble forms (expressed as metallic arsenic) in the case of products containing arsenic, and in the case of products that "consist partially or completely of an inert substance or substances which do not prevent, destroy, repel or mitigate insects or fungi," a plain and correct statement of the name and percentage amounts of each and every such inert ingredient contained in the product, or a plain and correct statement giving the name and percentage amounts of each and every ingredient having insecticidal or fungicidal properties and the total percentage of inert ingredients present.

It is reasonable to suppose that Congress had in mind, when inserting this provision, that this statement should be in language readily understandable by the mass of the American people, which is the English language. The provision that the ingredients shall be "plainly and correctly" stated is significant. The word "correctly," of course, means just that. The word "plainly" may, to a certain extent, be a matter of opinion. Here again, however, we are justified in assuming it was the intention that the statement be so placed that it will be readily noted by the buyer when he makes his purchase, and not in inconspicuous type or position where he would have to hunt for it, or in a form that is not clear and might be misleading.

There is no provision in the law requiring that directions for use of the product shall be given on its label, although it would be desirable had it contained such a provision. It was no doubt felt by the framers of the law that directions would be given as a matter of course, in order to acquaint the buyer with what the product was for, and how to use it, if for no other reason than to enhance its sale.

With reference to the use of language other than English, any statement, in addition to those required regarding the ingredients, may be used on the label in any language the manufacturer chooses to use provided it is true and not made in a way that the meaning is ambiguous and may be misleading. Careful attention should be paid to that word, "misleading." As has been stated by the courts, "Deception may result from the use of statements not technically false or which may be literally true * * * It is not difficult to choose statements, designs, and devices which will not deceive."

Another question on 161.12 (b)

Q. "Although there is no Federal requirement that the ingredient in our insecticide be shown on the label, we have for several years shown this information on our package. However as our direction label is quite crowded we include the ingredient information on the side of our can and run the lines vertically instead of horizontally. The new ruling says that the ingredient statement, when required, must not be materially less conspicuous than any other word or statement on the label. Would we be apt to be in violation of the new regulations because our ingredients contents are shown as indicated above?"

A. While this is a new regulation it is the procedure we have been following for years. It is being issued in the form of a regulation so that manufacturers may be fully informed of the requirements. Answering the specific question raised, any statement regarding the ingredients contained in a preparation which, under the terms of the law, does not require an ingredient statement, is gratuitous information and as long as it is a true statement, and not misleading, there are no restrictions as to where or how it may be placed.

Reg. 161.14

Q. "We are not exactly sure whether our signature conforms to the letter of this requirement. We show the following signature on all of our specialty packages (name fictitious):

Oil Specialties Division
Star Oil Corp.—Star Refining Co.
Star Bldg., Empire City, Mo.

Empire City is the home office of both the Star Oil Corp. and the Star Refining Co. although most of our specialty products are manufactured and packed at Electra, Texas, while some are manufactured and packed at plants in other States."

A. As stated in the regulation, it is not required that the name and address of the manufacturer be given on the label, but if given it must be correct. In case a manufacturer has more than one branch, it is sufficient to give the address of the home office of the firm.

Reg. 161.12 (d)

Q. "Any implication that the product is recommended or endorsed by any agency of the Federal Government is considered misleading. We have, at times, because we thought it would be good information, quoted from a state Experiment Station bulletin showing this matter in quotation, with the reference. This was in no way construed to make it appear that it was endorsed by any agency."

A. There is no objection to quoting from a Government bulletin provided a sufficient amount of the text is given so that the quotation is not misleading. It would evidently be improper to make any statement, either directly or by implication, that the Federal Government or an agency thereof endorsed any proprietary preparation.

Reg. 161.15

Q. I buy my insecticide in bulk from a manufacturer, from whom I hold a guarantee, and repack, putting on my labels. Am I protected under this guarantee?"

A. You are responsible under the law for a product packed and sold by you under your own label, which then becomes your own product, and the responsibility cannot be placed on the supplier of the material.

(Same Regulation.)

Q. "I manufacture an insecticide for various dealers, pack it, apply labels furnished by the dealer, and ship it out on their orders. Am I responsible under the law for all of the claims on the labels furnished me by the dealers?"

A. The answer is "Yes."

Reg. 161.15

Q. "The recently published regulations affecting the enforcement of the

100% Kill?

At Regina, up in Canada where part of the film, The Invaders, was photographed, clouds of grasshoppers clogged the air and forced Cameraman Freddy Young to shoot from closed cars. The grasshoppers got so bad that there was danger of the whole sequence being called off or deferred, but flocks of greedy seagulls suddenly appeared and obligingly gobbled and gorged until the insects had disappeared.

Federal Insecticide Act of 1910, provide that 'the manufacturer may guarantee to subsequent purchasers that the products concerned are not adulterated or misbranded within the meaning of the Act.'

"The Act provides that insecticides or fungicides will be considered to be misbranded if 'it is intended for use on vegetation and shall contain any substance or substances which although preventing, destroying, repelling or mitigating insects or fungi, shall be injurious to such vegetation when used.'

"It is understood by manufacturers, distributors and consumers alike that even insecticides which are properly formulated and manufactured are capable, if used improperly or if used under unusual conditions which are not necessarily recognizable, of causing injury to the plant of vegetation. It is questionable whether it is even possible to manufacture an insecticide or fungicide which will not, under certain conditions, cause injury to vegetation. It is likewise well known that pure water sprayed on plants under certain conditions will cause injury to those plants.

"We understand that it is not the intention of the Food and Drug Administration to prosecute manufacturers in cases where the spray material concerned has been properly formulated and manufactured, even though injury may be caused under conditions such as those indicated above. However, it appears to use that, if the above-quoted language is interpreted literally, strict compliance with the law is impossible, in view of the circumstances just outlined, and that a manufacturer, in guaranteeing to a purchaser that an insecticide or fungicide is not misbranded or adulterated within the meaning of the Act, would be certifying that he is accomplishing the impossible.

"We feel, therefore, that the wording of the law does not express the intent of the legislators and is obviously unfair to manufacturers and dealers in insecticides and fungicides and, further, that the regulations mentioned serve only to aggravate an already intolerable situation. We feel that, in fairness to manufacturers and dealers in insecticides and fungicides, the proper authorities should clarify this matter."

A. The statement quoted in the question comes under the adulteration section of the Act and not the misbranding section. However, the same answer would apply in either case.

In enforcing this provision of the law it is assumed that you can not go beyond the claims made on the label, or, if no directions are given on the label (which is frequently the case in such standardized products as lead and calcium arsenates), go beyond the uses as recommended by authorities and understood by growers generally. If the user of a product applies it in any way other than the manufacturer directs or than that recognized as standard practice, the manufacturer can not be held responsible.

The last and only question relating to the regulations with reference to "IMPORTS":

Regs. 161.17, 161.18

Q. "May these regulations be construed to mean that an importer of, say, pyrethrum flowers and derris preparations, would be required to notify the Agricultural Marketing Service of such a purchase, or is that entirely up to the collector to notify that department?"

A. There is no obligation on the part of the importer or his agent to notify the Agricultural Marketing Service of import shipments he is about to receive. This duty rests on the customs service. It has been the practice of some manufacturers to notify our laboratory at the port of entry where a laboratory is located of incoming shipments with the idea that this would expedite the release of the goods. Under our present method of procedure, however, nothing is gained by so doing.

The purpose of the Insecticide Act is to keep misbranded or adulterated insecticides and fungicides out of the channels of interstate commerce, to promote honest labeling and fair dealing, and thus enable the purchaser to obtain what he calls for. Legitimate industry, as well as the consuming public, has a right to expect protection and enforcement officials owe a duty to both groups. This is the basis on which those officials, to whom the administration of this act is delegated, endeavor to function.

EDITOR'S NOTE: *Reprinted from Soap & Sanitary Chemicals, January, 1942.*

"Science to Tune in on Crunch of a Termite's Jaw"

For lo, these many ages,
According to the sages,
  You termites have been doing as you please;
In all of history's pages
There are few more gross outrages
  Than your chewing at our homes prepared from trees!

But now your days are numbered,
Your progress is encumbered,
  For science can detect your noisy crunch;
Our houses neatly lumbered,
Where we have lived and slumbered,
  No more are invitations for free lunch!

So, termites, fold your banners!
You see, your uncouth manners
  Have finally o'ertaken you at last;
You're among the also-ranners,
Just a lot of cheap tinpanners,
  For you smack your jaws too loudly at repast!

—NEWCOMER.

NOW YOU CAN BUY

4 to 1 Concentrate

FOR RATS AND MICE

(Just Dilute With Water)

Per-Mo Rat and Mice Exterminating Liquid can be used as a drink or can be mixed with any food and used as a bait.

Economical to use and a "Guaranteed" Rodent Exterminator.

Send $1.00 for a 16-oz. Bottle CONCENTRATE RAT & MICE EXTERMINATING LIQUID. Postage Prepaid.

PER-MO MOTHPROOF CO.

3729 Virginia Ave. Dept. R Kansas City, Mo.

Don't Fret Over the Rubber Shortage . . . Do As Many Exterminators Are Doing . . .

Use . . .

HOUCHIN'S METAL INSECT POWDER BLOWERS

STURDY • DURABLE • LONG SERVICE

Thos. W. Houchin Corp.

87 Ferry Street
Jersey City, N. J.

BUY . . . U. S. Defense Bonds and Stamps

Wil-Kil Occupies New Building

Pattern for Advancement of Industry-Public Relations

Those who have had the privilege of witnessing Henry Turrie's motion picture "Insect and Rodent Enemies of Man," or similar industry films, will appreciate what is meant when we say that he has pioneered a dignified and constructive technique which has done much to spur an enhanced public appraisal of the benefits of scientific pest control. Keeping the same objective in mind, he has just announced the opening of his new building, modernistic in design, which will house under one roof his pest control activities, and which will unquestionably exert its intended influence. To publicize the fact, he ran a 450 line advertisement (150 lines over three columns) in The Milwaukee Journal, which, because it pervades a dignified, professional atmosphere, is sure to make its impress, and will, we hope, find greater acceptance and usage amongst PCOs. In order that readers may have a better idea of its substance, a reset on a reduced scale follows:

YOU ARE INVITED TO VISIT OUR NEW HOME

Thanks to the thousands of people who, for many years, have entrusted us with the responsibility of pest control problems which endangered health and resources in their homes, apartments, offices, restaurants, hotels, drug stores, bakeries, wholesale and retail food markets, etc.

Now, in our new building we have four times as much floor space and with our new and modern equipment, will be able to give you even better service in the future.

According to the United States Department of Agriculture, there are over 150,000,000 rats and 500,000 different kinds of insects. Some feed on the blood of man and animals, others feed on and destroy food, clothing, furniture, carpets and rugs, wood, etc.

Pest Control in National Defense

The Pest Control Industry plays a vital part in protecting food and other resources from contamination and destruction by insects and rodents, thereby safeguarding the health and strength of all manpower defending America.

WIL-KIL
522 W. North Ave. **COncord 3430**

Reports from visitors to the house-that-pest-control-built all agree that Mr. Turrie, as well as the industry, have mighty good reason to be proud —as indeed they are—of his signal accomplishment. For, back of every such concept is a blueprint, the sum of the lines in which lies the hopes, experiences, ideas and ideals of its originator. The following is an added word-picture which should help round out the story:

The lot is 40 x 155 feet, and the building itself is 32 x 75 feet, with a 9 foot private driveway on one side leading to the entrance for our fumigation chambers where furniture and other necessities are loaded and unloaded. The front of the building is carried out in structural glass with the canopy extending 12 feet over the sidewalk.

Exhibit Room and Service Counter: The door visible in the picture leads into the general office. On the opposite side is a door leading into Mr. Turrie's office. The miniature house was built at the scale of 1½ inches to a foot. It shows the usual building construction—space in between inner and outer walls and between ceilings and floors, where vermin and rodents might breed. It also shows the different types of insulation and the types of lumber that may be attacked by powder post beetles, termites, and other wood-boring insects. It also helps to explain to people how rats and mice enter homes or buildings through faulty construction.

The entire house has little explanation cards placed here and there such as one indicating how bats, rats, mice, squirrels, starlings, wasps, bees, etc., may enter the house through defects in the roof.

Fumigation Chambers: These chambers have been built in accordance with government bulletin specifications. Each of the chambers is 9 x 10 feet with four inches of rock wool insulation all the way around and it is metal lined. It is equipped with electric heaters, automatically controlled, with a thermometer on the inside, visible through a porthole. The automatic control makes it possible to treat furniture and other materials all the way from 65 degrees to 250 degrees. It has been used for the past 60 days and the results are very desirable.

The pipe leading to the outer wall goes into a solid brick construction of 20 x 20 feet, where automobiles can be fumigated, as well as large loads of furniture often received, which would not fit into ordinary chambers. The blower used for exhausting the gasses in the chambers is also used for the purpose of exhausting the gas from the outside fumigation chamber. The numbers to the side of each damper on the panel above Chamber B are used for circulating the gas from one individual chamber or both.

No. 8 leads to the outside stack; No. 7 is the pipe leading to the outside chamber; Nos. 1, 2, 3, 4, 5 and 6 are used for recirculating the gas from one chamber to another. The top of the chamber, as you will notice in the picture, is used for storage space.

To the left of the chambers is the laboratory.

With booklets like "Pests and People," industry pictures like "Insect

The outside and inside of the new modern PCO plant and office as shown above is another excellent avenue of advertising to impress the public the importance of PCO service. Henry Turrie of Milwaukee, Wis., is the owner of the business. Best wishes to you Henry and here's hoping that business exceeds all previous sales.

and Rodent Enemies of Man," and structures of the Turrie-type, a mosaic for advancement of Industry-Public Relations has now taken definite form. It shouldn't be very difficult, therefore, to foresee in the reasonable future, development of additional means, similar in scope or essence, so that an industry facade may be erected which will even more truly reflect its intransic capabilities, its professional character, and its indispensable place in the public weal and war emergency.

Congratulations, and best of luck to Mr. Turrie in his new business home!

Mr. Turrie, Wil-Kil, whose address is 522 W. North Avenue, Milwaukee, Wis., has very kindly asked us to extend an invitation to every PCO passing through to stop off for an inspection visit and a chat. —Editor.

Cyanide Speeds Maturity

Cyanide compounds, deadly in higher concentrations, seems to have a decided effect in speeding the onset of maturity, Dr. John R. Borland of Hofstra College and N.Y.U. reported concerning tadpole-to-frog transformation which he had observed in his laboratory.

—Science News Letter.

LOCAL ORGANIZATION NEWS

New England Pest Control Assn., Passes Resolution

Volunteers Its Pest Control Services As Emergency War Measure At Meeting Hotel Lenox, Boston, March 24, 1942

Dr. G. Lynde Gately, Health Commissioner, Health Dept., Boston, Eulogizes Importance of Industry

With practice blackouts—a make-ready for the real thing—the order of the night, and because bombings, if and when they occur, may release a dangerous incidence of pests, members of the New England Pest Control Assn., present at meeting on March 24, acted with commendable zeal and timeliness in order to be ready to cope promptly with any critical pest situation that may arise, by unanimously voting the ensuing resolution, wherein they plan to make available to accredited public authorities their control facilities and services for emergency war work:

> Resolved: That a survey be made to determine the number of men, cars, trucks and facilities incidental to the conduct of the Pest and Rodent Control which are available in case of bombing, conflagration or conditions arising from war;
>
> That the information resulting from this survey be submitted to the Health Executive Committee of the Massachusetts Committee on Public Safety together with an offer to form a sub-committee with the Health Executive Committee for devising such plans for future action as may be desirable; that this information and offer be made to the Department of Public Health of Massachusetts and the City of Boston, Board of Health.

Featured talk (published in this issue) of the evening was made by Dr. G. Lynde Gately, Health Commissioner, Health Dept., Boston, who spoke in glowing terms of the industry's place in the war effort and in the peace times to follow.

Other subjects of interest on the agenda were: Treasurer's Report which showed a balance of $438.74, as of March 24, 1942; Analysis of questionnaire sent to the Industry was made by Prof. Blake; Mr. Corey made a full length report on activities of his committee; President Mark Weintraub, who presided, read resolution drafted by Public Relations Committee; Ten firms agreed to contact their local Health Departments regarding resolution of this Committee; Bart Eldridge reported on efforts of N.P.C.A. to attain Industry recognition in Washington; Charles Houghton made motion, seconded by Mr. Corey, to send 1000 copies of PESTS, and People to Dr. Gately; Mark Weintraub commented briefly on next "War Extra" bulletin from NPCA;

Prepared to Kill?

Prentiss Pyrethrum Products with high **Pyrethrins** content are your best guarantee of dependable **Killing Power.**

Prove to yourselves that **Prentiss Pyrethrum Products** can be relied upon for **High Killing Power at a Minimum Cost.** Write for samples and prices on—

- **CLARIFIED PYRETHRUM No. 20**
- **HIGH TEST PYRETHRUM POWDERS**
- **ACTIVATED DUST**
- **POWDERED RED SQUILL**
- **POWDERED DERRIS ROOT**

Wise PEST CONTROL OPERATORS are substituting PYRETHRUM POWDER for SODIUM FLUORIDE which is almost UNOBTAINABLE. For this SUBSTITUTION PYRETHRUM POWDER of lower PYRETHRIN CONTENT may be used. Write us for special prices.

R. J. PRENTISS & CO., INC.
80 JOHN STREET NEW YORK

DON'T LET SCARCITY OF RODENT BAITS *get you down!*

LARVACIDE offers a simple, speedy and usually cleaner way to exterminate rodents. Larvacide follows the principle of ATTACK. Instead of waiting for the pests to come and get it, this tear gas fumigant *goes after them*, driving them out of retreats to die on the open floor usually without carcass nuisance.

No Carcass Nuisance

Light, Economical Dosage — **As little as pint or so for each thousand square feet of floor space, with overnight exposure, is effective. Small indoor areas may be treated without mask protection.**

Conveniently Put Up; Quickly Available — **Use Larvacide in outside burrows, and in warehouses and all types of buildings. Complete instructions accompany each bottle. The 1-lb. bottle (in wooden cases of 6 or 12) is especially convenient in rodent work and other small jobs. Cylinders too, 25-180 lbs. Stocked in major cities.**

Larvacide
CHLORPICRIN
. . . the Original Tear Gas Fumigant, has been used in Home and Industrial Fumigation for more than seventeen years.

INNIS, SPEIDEN & COMPANY
Established 1816
117 Liberty Street
NEW YORK
CHICAGO CLEVELAND CINCINNATI BOSTON PHILADELPHIA OMAHA

a warning was sounded regarding itenerant rat operators and possibilities of such individuals operating in New England. Report submitted by Thomas A. Sheehan, Secretary, NEPCA.

Louisiana Pest Control Operators

A general meeting of all pest control operators of the State of Louisiana was held on March 23rd at the Louisiana Capitol Building in Baton Rouge. Discussion centered mainly around the possible revision or amendment to the existing state law governing pest control operations. W. E. Anderson of the Louisiana Horticultural Commission expressed the opinion that the pest control operators should from their experiences and practical every day pest control make recommendations as to desired amendments or any changes of the existing law.

Termite control was given major attention with considerable comment as to the lengths of guarantee periods. The concensus of opinion was that a guarantee should be given for no more than two years.

It was recommended unanimously that there be pointed a full time inspector so that all jobs could be thoroughly inspected.

A committee composed of L. S. Bridges, Ernest R. Barber, Roy H. Banister, H. C. Jamerson, S. J. Rosenthal, and Joseph Mandlebaum, charged with the duty to present amendments and recommendations as to changing the present state law.

A permanent State Association of pest control operators was voted and at a subsequent meeting, officers and Constitution and By-Laws will be adopted.

Among those in attendance were: S. J. Rosenthal, New Orleans; M. J. Hanley, Shreveport; Donald L. Jackman, New Orleans; Joseph Mandlebaum, New Orleans; Harry Schroeder, Monroe; Cecil R. Blair, Alexandria; E. R. Barber, New Orleans; Arthur Denis, New Orleans; H. D. Hagerty, Covington; H. C. Jamerson, Shreveport; Frank Pacholik, Alexandria; L. H. Shrauger, Lafayette; L. S. Bridges, Baton Rouge; E. B. Harang, Jr., New Orleans; John Hogan, New Orleans, and Roy Banister, Lake Charles.

Master Pest Control Operators Dayton, Ohio

Nine of the ten members of the Master Pest Control Operators of Dayton, Ohio held a dinner meeting at the VanCleve Hotel on March 23rd. Guests who attended the meeting included the Mayor, City Manager and City Attorney who represented the Examining Committee for Pest Control Operators.

The feature of the evening was the showing of the motion picture "Insect Enemies of Man". General discussion followed on matters of local interest to the pest control operators.

Among those who have expressed their pleasure about the success of the meeting include R. R. Littell, President of the local group who conducts the Safe-way Exterminator Co.; William H. McCain, Extermital Chemicals, Inc.; and Richard K. Barnett, The City Pest Control Co.

A little philosophy inclines men's minds toward atheism; depth in philosophy brings men's minds about to religion.

—Francis Bacon.

Alabama PCOs Meet

Suggest Revisions in State Law at Whitely Hotel, Montgomery, Ala., March 28, 1942. — Vote State Association Into Existence

At a meeting in Montgomery called by B. P. Livingston, Chief of Division of Plant Industry, Department of Agriculture and Industries, and at which he presided, Alabama PCO's availed themselves of his invitation to suggest changes and revisions they deemed advisable in the present State Law regulating the Industry. Mr. Livingston promised their suggestions would be considered by the Board for possible submission to the next session of the Legislature in 1943.

Recognizing the benefits of meeting regularly to discuss matters of mutual interest, the PCO's present, upon a motion made and seconded by Robert L. Hunt and Glenn H. Burnett respectively, voted unanimously to form a State Association and elect officers. The nominating committee's suggested panel of officers, which follows, was unanimously adopted: President, F. C. Harned; Vice-President, Wm. Roniotis; Secretary, C. W. Bentley.

Inveighing against the unqualified and dishonest elements practicing so called pest control, Prof. J. M. Robinson, Head, Dept. of Zoology-Entomology, Alabama Polytechnic Institute in Auburn, reviewed resultant regulatory legislation now on statute books in several Southeastern states. Termites, the need for research to develop better, cheaper and safer methods of insect control, and strict enforcement of regulations to protect the public against fraud, were among his other topics.

Taking his cue from the practice of other professional groups, Prof. F. E. Guyton, of Alabama Polytechnic, urged similar pooling of information and experiences of those present for the benefit of the Industry; he further advocated as of great help interchange of theoretical and practical findings between entomologists and PCO's. Prof. Guyton, in addition, discussed Powder Post Beetles which stimulated questions and comment from the floor.

In his talk Dr. F. S. Arant, also of Alabama Polytechnic, pointed the great need for efficient pest control service at reasonable cost, for the householder, the commercial establishment, and for the horticultural field as well. Major part of his remarks, however, centered around rats and fleas, the diseases they transmit, and suitable methods for flea control. Spirited discussion followed.

In attendance were: Mary E. Parsons, Home Termite Co., Montgomery; C. W. Bentley, Home Termite Co., Montgomery; G. H. Burnett, Getz Exterminators, Inc., Atlanta; A. B. Hollingsworth, Orkin Exterminating Co., Montgomery; A. S. Krawcheck, Orkin Exterminating Co., Birmingham; F. C. Harned, Alabama Termite Co., Birmingham; W. J. Newsom, Newsom Termite and Pest Control Co., Birmingham; Wm. Roniotis, Termonox Compound Co., Birmingham; Robert L. Hunt, U. S. Exterminating Co., Montgomery; Neville H. Wallace, Exterminating Service Co., Birmingham; Dr. F. S. Arant, Alabama Polytechnic Institute, Auburn; D. H. Copeland, Alabama Polytechnic Institute, Auburn; Prof. F. E. Guyton, Alabama Polytechnic Institute, Auburn; Prof. J. M. Robinson, Alabama Polytechnic Institute, Auburn; B. P. Livingston, Chief, Division of Plant Industry, Montgomery; H. H. Williams, Birmingham Termite Co., Birmingham; Christian Albers, Albers Exterminating Service Co., Montgomery.

Report Submitted by G. H. Burnett.

Entomologists and PCOs Meet

The 21st Annual Conference of the North Central States Entomologists was held at the University of Illinois, March 26-27, under the chairmanship of W. P. Flint, Chief of the Division of Entomology of the Illinois Natural History Survey. Nearly 200 entomologists registered for the conference.

The conference dealt with many phases of entomology, including cereal and forage crop insects, insects affecting man and animals, insecticides, vegetable and greenhouse

INSURANCE PLUS!

★

Every Responsible PCO Realizes the Imperative of Adequate Insurance Coverage Against the Normal Hazards of His Profession.

We suggest, therefore, that you avail yourself of the facilities of an organization (in business since 1915) that has pioneered in complete insurance protection for the Pest Control Industry; and, who, today, are the largest writers of this type coverage in the U. S. . . . Our co-operation with the national and all local pest control associations has brought about substantial underwriting benefits for the industry. . . . Our policies are issued in American stock companies in all states.

- **PUBLIC LIABILITY**
- **WORKMEN'S COMPENSATION**
- **FIVE YEAR TERMITE GUARANTEES**
- **AUTOMOTIVE AND ALLIED LINES**

Full Protection Now Available Against War and Bombardment

MEMBER NATIONAL PEST CONTROL ASSOCIATION

Send Us Your Insurance Problems For Analysis Without Obligation

★

B. & D. A. WEISBURGER

1440 BROADWAY, NEW YORK

insects, household insects, beekeeping, fruit insects, insect photography, and stored products insects. The initial session Thursday morning, March 26, dealt with the general subject, "How Entomologists Can Best Contribute to the Victory Program and the War Effort."

The North Central States Entomologists Conference is unique in that no prepared papers are permitted. The proceedings are taken down by stenographers and these are mimeographed. Since there are no dues those attending contribute 75 cents each to help defray costs of mimeographing the proceedings. Anyone wishing a copy of the proceedings may obtain one by sending 75 cents to Prof. W. P. Flint, Illinois Natural Resources Building, Urbana, Illinois.

Commercial pest control operators who attended the meetings included the following: Norman Dold, Walter McCloud, Max Rukin and Harold E. Jennings of Chicago; Charles Denny of St. Louis; Henry Turrie of Milwaukee; George Hockenyos of Springfield, Illinois; Charlie Houghton of Boston; Harvey Sturgeon of Louisville, Ky; H. B. Jordan of Indianapolis; and E. A. Villiers of Columbus, Ohio.

The next conference will be held March 25 and 26, 1943 at Purdue University, Lafayette, Indiana.

Connecticut Pest Control Association

A dinner meeting was held at the City Club at Hartford, on Tuesday, April 14th, by the Connecticut Pest Control Association. Fred Haas, President, presided and was assisted by former president F. H. Bohman who served as toastmaster.

The business of the evening was largely a discussion of the importance of the pest control industry especially with relation to war efforts. Brief talks were given by Dr. S. H. Osborne, Health Commissioner of the State of Connecticut; George B. Lay representing the Fish and Wildlife Service and Neely Turner who brought greetings from Dr. Friend who was unable to attend. Secretary "Bill" Buettner of the National Pest Control Association outlined several pertinent ways in which the industry could make itself felt not only as an essential but almost indispensable industry in these days of united efforts to win the war.

The guest speaker of the evening was Prof. Charles H. Blake of Massachusetts Institute of Technology who spoke of various insect vectors of diseases. The necessity of coping with this problem not only for our armed forces at home and abroad but our entire citizenry rested very largely with the pest control operators. Typhus came in for much discussion as did other health hazards following insect and rodent infestations.

A delegation of the New England Pest Control Association headed by President Mark Weintraub demonstrated the close relationship that prevailed among pest control operators no matter where located.

Among those present were: Fred Haas, Aetna Exterminating Co., Hartford, Conn.; O. N. Anderson, Berg Exterminating Co., Hartford, Conn.; F. E. Bohman, Birchard System, Inc., Hartford, Conn.; H. H. Borne, Health Officer, Hartford, Conn.; Neely Turner, Entomologist, Conn. Experiment Station, New Haven, Conn.; George Chapman, American Cyanamid & Chemical Corp., New York, N. Y.; Joseph Putinski, City Storage Co., New Britain, Conn.; Frederick Dietz, Dietz Exterminating Co.; Waterbury, Conn.; Thomas J. Ledwith, Berg Exterminating Co., Hartford, Conn.; B. W. Eldredge, Waltham Chemical Co.; Waltham, Mass.; John Duncan, Birchard System, Inc., New Haven, Conn; David A. Weisburger, B. and D. A. Weisburger, New York, N. Y.; D. Mason, Mason Exterminating Co., New Haven, Conn.; L. H. Bureau, A. B. C. Exterminating Co., New Haven, Conn.; Walker R. Heap, Abbott Pest Control, New Haven, Conn.; George R. Elliott, Ransford Insecticide Co., Worcester, Mass.; Dr. S. H. Osborne, Health Commissioner, State of Connecticut; Mark Weintraub, Pres., New England Pest Control Assn., Boston, Mass.; George B. Lay, Fish and Wildlife Service, U. S. Dept. of Interior, Boston, Mass.; William O. Buettner, Secretary, National Pest Control Association, Brooklyn, N. Y.; Professor Charles H. Blake, Massachusetts Institute of Technology, Cambridge, Mass.; Frances B. Schuler (Agent in Rodent Control) Fish and Wildlife Service, U. S. Dept. of Interior, Storrs, Conn.

WHAT'S NEW IN PEST CONTROL-PERSONALS

Cardon Named Assistant Research Administrator: Secretary Wickard appointed as Assistant Agricultural Research Administrator, P. V. Cardon, who for three years has been Assistant Chief of the Bureau of Plant Industry. In his new position Mr. Cardon will assist Dr. E. C. Auchter, Agricultural Research Administrator, in directing the work of eight research agencies of the Department.

Department of Romance: A romantic story credits discovery of pyrethrum's deadliness to a Persian beauty. It seems she discarded a bouquet of flowers and later noticed dead insects all around it. That, the story goes, eventually led to the use of ground-up pyrethrum flowers as an insecticide powder.

Conventions of Possible Interest: National Executive Housekeepers Assn., Statler Hotel, Detroit, June 3, 4, 5.

National Restaurant Convention and Exposition, 666 Lake Shore Drive, Chicago, October 5, 6, 7, 8, 9.

National Hotel Exposition, Grand Central Palace, New York City, November 9, 10, 11, 12, 13.

Standard Exterminating Co., Newark, N. J., Announce removal to new and larger quarters located at 214 Chancellor Avenue, that city. Congratulations and best wishes for your continued progress.

An Appraisal Technique for Urban Problem Areas as a Basis for Housing Policy of Local Governments: Report appearing in Public Health Reports, April 3, 1942 issue, No. 14 contains data of rat infestation in dwelling structure with business; 1-family, 2-family, 3 or more family (tenement); dwelling structure with business: 1-family, 2-family, 3 or more family (tenement), etc. Copy of report may be had from Superintendent of Documents, Washington, D. C., 5c (no stamps).

Insect Pests and Their Control: Booklet issued by Sinclair Refining Co., Inc., N. Y. includes data concerning: housefly, mosquito, bedbug, cockroach, ant, flea, lice, silverfish, black carpet beetle, clothes moth, stable fly, horn fly, insecticidal or "killing" agents, National Bureau of Standards Household Insecticide, The Peet-Grady Method, How Liquid Insecticides Kill Insecticides, How to Use Insecticides.

Rat-Catcher Reserved Occupation in England: So much has already been said about rats from the standpoint of diseases caused and damages done that we do not intend to enlarge on this enemy No. 1. Perhaps there

Phosphorus Paste
10 lbs., $4.25; 25 lbs., $9.
50 lbs., $17; 100 lbs., $32.50.
For the extermination of rats and roaches.

Bird Repellent
10 lbs., $6; 25 lbs., $13.50.
50 lbs., $25; 100 lbs., $45.
Keep buildings free of roosting birds.

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is story enough by merely quoting from the syndicated column "Front Views and Profiles" by Marcia Winn, when in the Chicago Daily Tribune on March 20 reference is made about a list of types of workers officially reserved from draft in England: "In a partial list of which 22 reserved occupations are mentioned, together with the reservation age of each, we find mole catcher, rabbit catcher, rat catcher—30 years of age."—*N.P.C.A Service Letter No. 245.*

NEW INSULATING MATERIAL

From Science News Section, N. Y. Times, comes word that more than 200,000,000 board feet of insulating materials will be needed in 1942. Before the war cork, mostly imported from Portugal and Spain, met this demand. Such are the hazards of shipping and such the rigors of priorities that builders are now turning to an asphalt-enclosed board made of fiber glass, a new basis material produced wholly within the U. S. You can walk on this board without injuring it. It is odorless itself and it will not absorb odors. It resists fire. It will not harbor vermin. Its heat conductivity is about as low as that of any known building material. It is made of glass mineral wool heavily coated with durable asphalt with a high melting point.

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Francis Despard Dodge, chief research chemist of the Dodge & Olcott Company, dealers in essential oils, of 180 Varick Street, died recently of a heart ailment in the Waldorf-Astoria. He was seventy-four years old.

Mr. Dodge's home was in Cranford, N. J. He became ill while attending a dinner at the Waldorf-Astoria last Thursday night of the drug and chemical division of the New York Board of Trade and had remained at the hotel.

Mr. Dodge was born in Washington. He was graduated from the Brooklyn Polytechnic Institute in 1884 and from the Columbia University School of Mines in 1888, and after attending Heidelberg University in Germany for two years obtained his doctorate of philosophy at Columbia University in 1891. He was an instructor in chemistry at Columbia for a year before he joined the Dodge & Olcott firm in 1891. His wife, Mrs. Ella Patterson Dodge, survives.

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Using Baits in Rat Control

(Continued from Page 7)

the same food placed in dishes. It was learned that 10.96% body weight of the rats in bait was eaten from the floor and only 4.64% from the dishes. Again, a questionnaire by 47 Pest Control Operators yielded the opinions that 27 of them thought that wrapped baits were better taken, with 20 operators stating that unwrapped baits were more satisfactory. On the other hand, most writers on rat control do not recommend any particular way of wrapping or placing bait. However, it is the general recommendation of the Fish and Wildlife Service that rats will take unwrapped baits placed directly on the floor of trails better than any other procedure. It is recognized that it might be desirable in some cases to wrap certain toxic baits as wrapped baits are less likely to be taken by dogs, cats, and other animals.

All baits should be placed in all places where rats might feed upon them. Rats usually take definite routes so that their trails or runways should be found. They seldom roam in the open or in the middle of a room but are more apt to run along the sides of a room or building, behind such objects as boxes, barrels, and pipes. Dark places are preferred to well-lighted ones. Baits should not be inserted into holes or burrows or placed near these exits but rather several inches from burrow openings except where it is highly important to protect baits from children or animals. When several kinds of bait are used, the baits should be alternated along the trails. Artificial runways are helpful in some instances and may be made by placing boards or boxes along walls to provide a natural protection as the rats move along. Special boxes can also be used. A detailed description of such a box to contain baits will be found in Conservation Bulletin No. 8 as mentioned above.

The ideal time of day to set baits is just before dusk and before all noise has stopped for the night. The baits should be prepared just previous to exposure unless permanent baits are used. By this arrangement, the fresh baits will be found by the rats when the baits are in prime condition, assuming wet or moist baits are employed.

The final problem to settle in exposing baits is the quantity in pounds of bait or in number of baits. No general rule can be given. In this matter much depends upon the judgment of the operator. If one could know in advance just how many rats are present, the baiting operation would be vastly simpler. To arrive at an estimate as the number of rats, the following signs should be noted: droppings, runways, tracks, damage, and nests. The occupant may be questioned but his statements may not be reliable. Possibly live rats will be seen during the course of an inspection. On ships, the U. S. Public Health Service estimated that there are 20 rats for every one seen. The results from successful prebaiting will give the most accurate picture on a rat infestation and a guide to the number of baits or pounds of poisoned bait that should be used. Probably twice as much poisoned bait should be used as prebaits. Thus, it seems impossible to state that so many pounds of bait should be used per square foot of floor space or that bait spots should be made every so many feet along trails, as situations differ so radically.

After the poisoning has been carefully carried out, it is important to check the baits the next day or two after exposure. These observations will be helpful if repeat baitings are necessary. If the initial baiting does not give complete results, repeat baitings with other baits and poisons should be postponed for two weeks or more, depending upon the poisons employed and other factors.

It is only an error in judgment to make a mistake, but it shows infirmity of character to adhere to it when discovered.

—*Bovee.*

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Additional Patents Relating to Pest Control

By **DR. R. C. ROARK**

EDITOR'S NOTE: *This service is provided through the Department of Agriculture for the purpose of bringing to the attention of those interested such matters that may be of assistance to the industry. The Department of Agriculture assumes no responsibility for the merits or workableness of of any of the inventions mentioned. Copies of all patents can be obtained for 10c (no postage stamps) sent to the Patent Office, Washington, D. C. When placing orders be sure to note the number of the patent, the date, the name of the patentee and the subject of the invention.*

2,268,941 (Jan. 6, 1942; appl. June 3, 1940). FLY GUARD FOR SCREEN DOORS AND LIKE. Walter G. Horstman, Des Moines, Iowa.

2,269,399 (Jan. 6, 1942; appl. May 23, 1939). DISUBSTITUTED CYANAMIDES. Richard O. Roblin, Jr., Stamford, Conn.—American Cyanamid Company, New York, N. Y.—Examples are p-nitro-phenyl benzyl cyanamide; o-chlorophenyl benzyl cyanamide and o-tolyl-1-naphthyl-methyl cyanamide. These new compounds are adapted for various uses, more particularly as insecticides.

2,269,891 (Jan. 13, 1942; appl. July 2, 1940). INSECTICIDE AND FUNGICIDE. Charles Verne Bowen, Bethesda, Md., and Frederick E. Dearborn, Washington, D. C.—Henry A. Wallace as Secretary of Agriculture of the United States of America and successors in office—An insecticide contains as its essential active ingredient copper benzoyl lacto-arsenite.

2,269,892 (Jan. 13, 1942; appl. June 20, 1940). INSECTICIDE AND FUNGICIDE. Roscoe H. Carter, Washington, D. C.—Henry A. Wallace as Secretary of Agriculture of the United States of America and successors in office.—A fungicide and insecticide contains as its essential active ingredient a heavy metal salt of the di-thiocarbamic acid of morpholine.

2,269,893 (Jan. 13, 1942; appl. June 20, 1940). INSECTICIDE. Roscoe H. Carter, Washington, D. C.—Henry A. Wallace as Secretary of Agriculture of the United States of America and successors in office.—An insecticide contains as its essential active ingredient the morpholine salt of the di-thiocarbamic acid of morpholine.

2,270,547 (Jan. 20, 1942; appl. Aug. 9, 1939). GARMENT BAG. Harold W. Nichols, Cincinnati, Ohio.

2,271,350 (Jan. 27 ,1942; appl. June 17, 1941). COMPOSITION OF MATTER FOR USE AS AN INSECTICIDE. Lloyd E. Smith and Herbert L. J. Haller, Washington, D. C.; dedicated to the free use of the Public in the territory of the United States of America.—The patentees claim the method of dissolving from above 0.01 percent to about 0.3 percent of rotenone in a petroleum spray oil, consisting of heating in an open vessel substantially pure rotenone with a fatty oil which is soluble in the petroleum spray oil at a temperature and for a length of time sufficient to dissolve the rotenone in the fatty oil, thence adding the resulting liquid solution, while hot, to the petroleum spray oil.

2,271,378 (Jan. 27, 1942; appl. Feb. 19, 1940; in Germany, Aug. 30, 1939). PEST CONTROL. Norman Edward Searle, McDaniel Heights, Del.—E. I. du Pont de Nemours & Company, Wilmington, Del.—The patentee claims a pest control composition useful for controlling economically harmful lower forms of life including bacteria, fungi, and insects, containing as an active ingredient a linear polymeric onium salt in which the multiple recurring linear polymeric unit comprises at least seven chain atoms, two of which are onium atoms of the class consisting of sulfur, nitrogen and phosphorous, separated by organic radicals attached to the onium atoms through carbon, one of the valences on each onium atom being satisfied by a radical being the anion of an acid and the remaining valences of the onium atom being satisfied by organic radicals attached to the onium atoms through the carbon, not more than one of the carbons attached to the onium atom being in turn joined to another carbon by a multiple bond.

2,271,400 (Jan. 27, 1942; appl. Aug. 16, 1940). MERCAPTOTHIAZINE SPIRO COMPOUNDS AND PROCESS OF MAKING SAME. Paul Swithin Pinkney, Wilmington, Del.—E. I. du Pont de Nemours & Company, Wilmington, Del.—A process of preparing polynuclear mercaptothiazines comprises reacting ammonia, carbon disulfide and a member of the class consisting of alicyclic ketones of at least five ring atoms having at least one ring carbon atom alpha to the carbonyl carbon linked to two hydrogen atoms and aldol-type self-condensation products of said ketones. The products of this invention are useful as insecticides, etc.

2,271,569 (Feb. 3, 1942; appl. Jan. 10, 1940). **Electrocuting Trap.** Sam Palos, Argo, Ill.

2,271,918 (Feb. 3, 1942; appl. Aug. 12, 1939). **Sanitary Silent Garbage Can.** Martin Glowka, New York, N. Y.

2,272,044 (Feb. 3, 1942; appl. June 25, 1940). **Insect Repellent.** Roscoe H. Carter, Washington, D. C.—Henry A. Wallace, as Secretary of Agriculture of the United States of America, and his successors in office.—An insect repellent contains as its essential active ingredient dimorpholine thiuram disulfide. Tests made against the Japanese beetle in dust applications, consisting of 2 parts talc and 1 part test material, showed a repellency rating greater than 8 pounds of acid lead arsenate, which is considered to be a maximum dosage for arsenate.

2,272,267 (Feb. 10, 1942; appl. Dec. 17, 1940). **Alkaline Earth Metal Salts of Dihydroxy Hexachloro Diphenyl Methane.** William S. Gump, Nutley, N. J.—Burton T. Bush, Inc., New York, N. Y.—The patentee claims compounds selected from the group consisting of mono-magnesium and mono-alkaline earth metal salts of 2,2′-dihydroxy-3,5,6-3′,5′,6′-hexachloro diphenyl methane. The substances of this invention may be used as antiseptic, bactericidal, bacteriostatic, fungicidal and preservative agents, in solid, liquid or emulsion form, either per se or in admixture with other substances.

2,272,268 (Feb. 10, 1942; appl. Dec. 17, 1940). **Alkali Metal Salts of Dihydroxy Hexachloro Diphenyl Methane.** William S. Gump, Nutley, N. Y.—Burton T. Bush, Inc., New York, N. Y.—The patentee claims mono alkali metal salts of 2,2′-dihydroxy-3,5,6-3′, 5′,6′-hexachloro diphenyl methane. The substances of this invention may be used as

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antiseptic, bactericidal, bacteriostatic, fungicidal and preservative agents, in solid, liquid or emulsion form, either per se or in admixture with other substances.

2,273,664 (Feb. 17, 1942; appl. Apr. 21, 1939). **Pest Control.** Norman E. Searle, Wilmington, Del.—E. I. du Pont de Nemours & Co., Wilmington, Del.—A pest-control composition contains as an essential active ingredient a cyclic amino-methyl sulfide. Examples are N-methyl formothialdine and thialdine.

2,273,687 (Feb. 17, 1942; appl. Oct. 21, 1939). **Diacylamino-1,3,5-Triazines.** Louis H. Bock, Glenside, and Alva L. Houk, Philadelphia, Pa. — The Resinous Products & Chemical Co., Philadelphia, Pa.—The process of preparing diacyl-substituted aminohydroxy-1,3,5-triazine comprises heating a mixture of reactants consisting essentially of a member of the group consisting of aliphatic carboxylic acids and aliphatic carboxylic acid anhydrides and dicyandiamide until reaction starts and thereafter heating the mixture until the reaction between said reactants is substantially complete. The diacyl-amino-1,3,5-triazines find use as bactericides and insecticides.

2,273,860 (Feb. 24, 1942; appl. June 4, 1938. In Canada March 4, 1937). **Insect Repellent.** Philip Granett, New Brunswick, N. J.—National Carbon Co., Inc.—The patentee claims an insect repellent composition which contains as an essential active ingredient at least one ester of a saturated aliphatic acid of the group consisting of a dicarboxylic acid having six carbon atoms to the molecule, a hydroxy dicarboxylic acid and a hydroxy monocarboxylic acid, said ester having at least six and not more than fifteen carbon atoms to the molecule, and the ester of said hydroxy monocarboxylic acid having an oxygen atom in ether linkage in the alcohol radical thereof when said alcohol radical contains not more than five carbon atoms. Examples are dibutyl dl-malate, ethylene glycol monoethyl other lactate, and diethyl adipate.

2,274,298 (Feb. 24, 1942; appl. Feb. 27, 1941). **Portable Sterilizing Unit.** Edward L. Koch, Williston Park, and Edward B. Hallihan, Brooklyn, N. Y.—George W. Gates & Co., Inc., New York, N. Y.

2,274,476 (Feb. 24, 1942; appl. Aug. 23, 1940). **Insecticide and Moth Larvae Repellent.** Ingenuin Hechenbleikner, Stamford, Conn.—American Cyanamid Co., New York, N. Y.—A moth larvae repellent comprises symmetrical dicyclohexyl guanidine in naphtha.

2,274,547 (Feb. 24, 1942; appl. Jan. 30, 1941). **Insect Trap.** Joseph H. Jackson, Clanton, Ala.

Insect Statistics

There are 700,000 named species of insects, and between 2,500,000 and 100,000,000 species altogether according to estimates.

—*Science News Letter.*

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Entomological Literature

A REVIEW OF INFORMATION ON ANABASINE

By R. C. Roark, Division of Insecticide Investigations, U. S. Dept. of Agriculture, Bureau of Entomology and Plant Quarantine, Washington, D. C. E-537—April, 1941.

Review includes the chemistry of anabasine; the determination of anabasine; occurrence of anabasine; the pharmacology of anabasine; the use of anabasine as an insecticide; reviews and popular articles on anabasine; index to insects against which anabasine has been tested.

RAT CONTROL

By James Silver, Regional Director and F. E. Garlough, Biologist, Division of Predator and Rodent Control, Fish and Wildlife Service issued by U. S. Dept of the Interior; Conservation Bulletin No. 8. Note—This bulletin supersedes Farmers Bulletin 1538, Rat Control, issued in 1927 by the U. S. Department of Agriculture—a contribution of the Bureau of Biological Survey, which was consolidated in 1940 with the Bureau of Fisheries to form the Fish and Wildlife Service, U. S. Dept. of the Interior.

Contents: Permanent Exclusion of Rats; Ratproofing, Removal of Shelter, Cutting of the Food Supply; Deterrents. Destruction of Rats: Poisoning; Fumigation; Trapping; Blocking; Use of Viruses; Deodorants. Natural Enemies of Rats. Community of Cooperation in Rat Control. Summary.

For sale by Superintendent of Documents, Washington, D. C. Price 10c (no stamps).

LAND SLUGS AND SNAILS AND THEIR CONTROL

Farmers' Bulletin No. 1895, issued March, 1942, by the U. S. Dept. of Agriculture, Washington, D. C., describes development and habits of some injurious snails and slugs and gives measures that may be used to rid premises or grounds of these oftentimes destructive and undesirable tenants. This bulletin supersedes Farmers' Bulletin No. 959, The Spotted Garden Slug, and may be obtained from Superintendent of Documents, Washington, D. C. Price 5c (no stamps).

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